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NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON

F/G 13/13

NATIONAL DAM SAFETY PROGRAM, KAMPFE LAKE DAM (NJ00772), PASSAIC--ETC(U)

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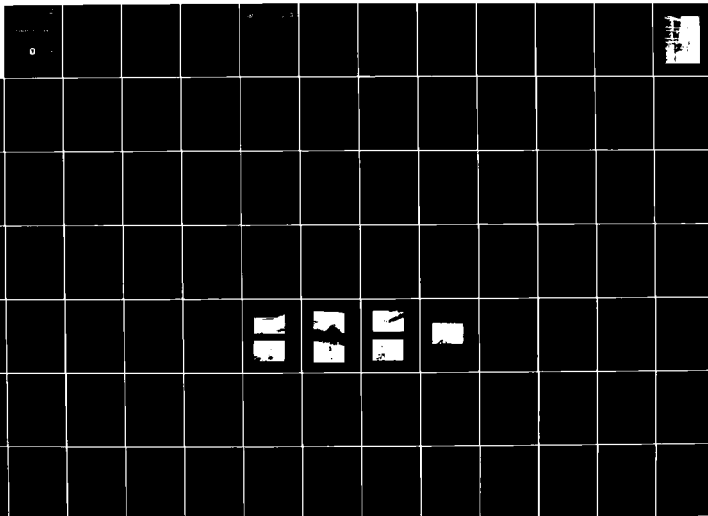
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LEVEL

PASSAIC RIVER BASIN  
TRIBUTARY TO PEQUANNOCK RIVER,  
PASSAIC COUNTY  
NEW JERSEY

AD A102672

# KAMPFE LAKE DAM NJ 00772

## PHASE 1 INSPECTION REPORT NATIONAL DAM SAFETY PROGRAM

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| 1. REPORT NUMBER<br>DAEN/NAP-53842/NJ00772-81/07   | 2. GOVT ACCESSION NO.<br>AD-A102672 | 3. RECIPIENT'S CATALOG NUMBER                        |
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| 7. AUTHOR(s)<br>Guinan, Warren, P.E. / uinan   |                                     | 6. PERFORMING ORG. REPORT NUMBER                     |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Anderson-Nichols<br>150 Casueway St.<br>Boston, Mass. 02114   |                                     | 8. CONTRACT OR GRANT NUMBER(s)<br>DACW61-79-C-0011   |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>NJ Department of Environmental Protection<br>Division of Water Resources<br>P.O. Box CNO29<br>Trenton, NJ 08625   |                                     | 12. REPORT DATE<br>July 1981                         |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)<br>U.S. Army Engineer District, Philadelphia<br>Custom House, 2d & Chestnut Streets<br>Philadelphia, PA 19106  |                                     | 13. NUMBER OF PAGES<br>50                            |
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| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>Dams<br>Embankments<br>Visual Inspection<br>Structural Analysis<br>National Dam Safety Program<br>Kampfe Lake Dam, NJ<br>Pequamock River, NJ<br>Passaic River Basin, NJ<br>Spillways<br>Seepage<br>Outlet works  |                                     |  |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report. |                                     |  |



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Honorable Brendan T. Byrne  
Governor of New Jersey  
Trenton, New Jersey 08621

31 JUL 1981

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Kampfe Lake Dam in Passaic County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Kampfe Lake Dam, a high hazard potential structure, is judged to be in fair overall condition. The dam's spillway is considered inadequate because a flow equivalent to 23 percent of the Spillway Design Flood - SDF - would cause the dam to be overtopped. (The SDF, in this instance, is one half of the Probable Maximum Flood). The decision to consider the spillway "inadequate" instead of "seriously inadequate" is based on the determination that dam failure resulting from overtopping would not significantly increase the hazard to loss of life downstream from the dam from that which would exist just before overtopping failure. To ensure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Within three months of the consultant's findings remedial measures to ensure spillway adequacy should be initiated. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around the clock surveillance should be provided.

b. Within three months from the date of approval of this report, the owner should engage a qualified professional consultant to perform the following:

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Honorable Brendan T. Byrne

(1) Investigate the cause of the seepage adjacent to the right wingwall of the spillway and left drawdown pipe, and the soft, damp areas at the downstream toe of the dam.

(2) Investigate the cause of seepage through the mortared stone masonry spillway.

c. Within six months from the date of approval of this report, the owner should engage a qualified professional consultant to perform the following:

(1) Design the relocation of the gate valves in the 12-inch drawdown pipes to place them at or near the inlets on the upstream side of the dam.

(2) Design the installation of a 16 inch gate valve on the upstream side of the dam to control the low-level outlet.

(3) Design procedures for the removal of trees and brush and their roots from the downstream slope of the dam.

(4) Design or specify repairs for the erosion of the upstream slope of the dam and replacement of the displaced erosion protection on the upstream slope.

d. Within 30 days of the date of approval of this report the following remedial actions should be initiated.

(1) Start a program of periodic monitoring of the seepage and wet area along the toe of the downstream slope.

(2) Replace flange bolts on low level outlet pipe and paint all exposed steel.

e. Within six months from the date of approval of this report, the following remedial actions should be initiated:

(1) Remove trees and brush for a distance of 25 feet downstream from the toe of the dam or to the property line whichever is the lesser.

(2) Backfill animal burrows on the downstream slope of the embankment.

(3) Complete the replacement of the service bridge deck.

(4) Clear trees and brush from the discharge channel and on either side of the spillway discharge channel for a distance of 100 feet from the spillway or to the property line whichever is the lesser distance.

(5) Repair concrete apron at the end of left side drawdown pipe at outlet.

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Honorable Brendan T. Byrne

f. The owner of the dam should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

g. An emergency action plan should be developed which outlines actions to be taken by the owner to minimize the downstream effects of an emergency at the dam within six months from the date of approval of this report.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Roe of the Eighth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Inspection Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,



ROGER L. BALDWIN  
Lieutenant Colonel, Corps of Engineers  
Commander and District Engineer

1 Incl  
As stated

Copies furnished:  
Mr. Dirk C. Hofman, P.E., Deputy Director  
Division of Water Resources  
N.J. Dept. of Environmental Protection  
P.O. Box CN029  
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief  
Bureau of Flood Plain Regulation  
Division of Water Resources  
N.J. Dept. of Environmental Protection  
P.O. Box CN029  
Trenton, NJ 08625



KAMPFE LAKE DAM (NJ00772)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 23 April 1981 by Anderson-Nichols & Co., Inc., under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

Kampfe Lake Dam, a high hazard potential structure, is judged to be in fair overall condition. The dam's spillway is considered inadequate because a flow equivalent to 23 percent of the Spillway Design Flood - SDF - would cause the dam to be overtopped. (The SDF, in this instance, is one half of the Probable Maximum Flood). The decision to consider the spillway "inadequate" instead of "seriously inadequate" is based on the determination that dam failure resulting from overtopping would not significantly increase the hazard to loss of life downstream from the dam from that which would exist just before overtopping failure. To ensure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The spillway's adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Within three months of the consultant's findings remedial measures to ensure spillway adequacy should be initiated. In the interim, a detailed emergency operation plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around the clock surveillance should be provided.

b. Within three months from the date of approval of this report, the owner should engage a qualified professional consultant to perform the following:

(1) Investigate the cause of the seepage adjacent to the right wingwall of the spillway and left drawdown pipe, and the soft, damp areas at the downstream toe of the dam.

(2) Investigate the cause of seepage through the mortared stone masonry spillway.

c. Within six months from the date of approval of this report, the owner should engage a qualified professional consultant to perform the following:

(1) Design the relocation of the gate valves in the 12-inch drawdown pipes to place them at or near the inlets on the upstream side of the dam.

(2) Design the installation of a 16 inch gate valve on the upstream side of the dam to control the low-level outlet.

(3) Design procedures for the removal of trees and brush and their roots from the downstream slope of the dam.

(4) Design or specify repairs for the erosion of the upstream slope of the dam and replacement of the displaced erosion protection on the upstream slope.

d. Within 30 days of the date of approval of this report the following remedial actions should be initiated.

(1) Start a program of periodic monitoring of the seepage and wet area along the toe of the downstream slope.

(2) Replace flange bolts on low level outlet pipe and paint all exposed steel.

e. Within six months from the date of approval of this report, the following remedial actions should be initiated:

(1) Remove trees and brush for a distance of 25 feet downstream from the toe of the dam or to the property line whichever is the lesser.

(2) Backfill animal burrows on the downstream slope of the embankment.

(3) Complete the replacement of the service bridge deck.

(4) Clear trees and brush from the discharge channel and on either side of the spillway discharge channel for a distance of 100 feet from the spillway or to the property line whichever is the lesser distance.

(5) Repair concrete apron at the end of left side drawdown pipe at outlet.

f. The owner of the dam should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

g. An emergency action plan should be developed which outlines actions to be taken by the owner to minimize the downstream effects of an emergency at the dam within six months from the date of approval of this report.

APPROVED:



ROGER L. BALDWIN  
Lieutenant Colonel, Corps of Engineers  
Commander and District Engineer

DATE:

31 July 81

PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM

|                     |                                  |
|---------------------|----------------------------------|
| Name of Dam:        | Kampfe Lake                      |
| Identification No.: | Fed ID No. NJ00772               |
| State Located:      | New Jersey                       |
| County Located:     | Passaic                          |
| Stream:             | Tributary to<br>Pequannock River |
| River Basin:        | Passaic                          |
| Date of Inspection: | April 23, 1981                   |

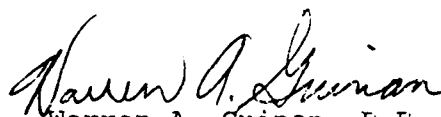
ASSESSMENT OF GENERAL CONDITIONS

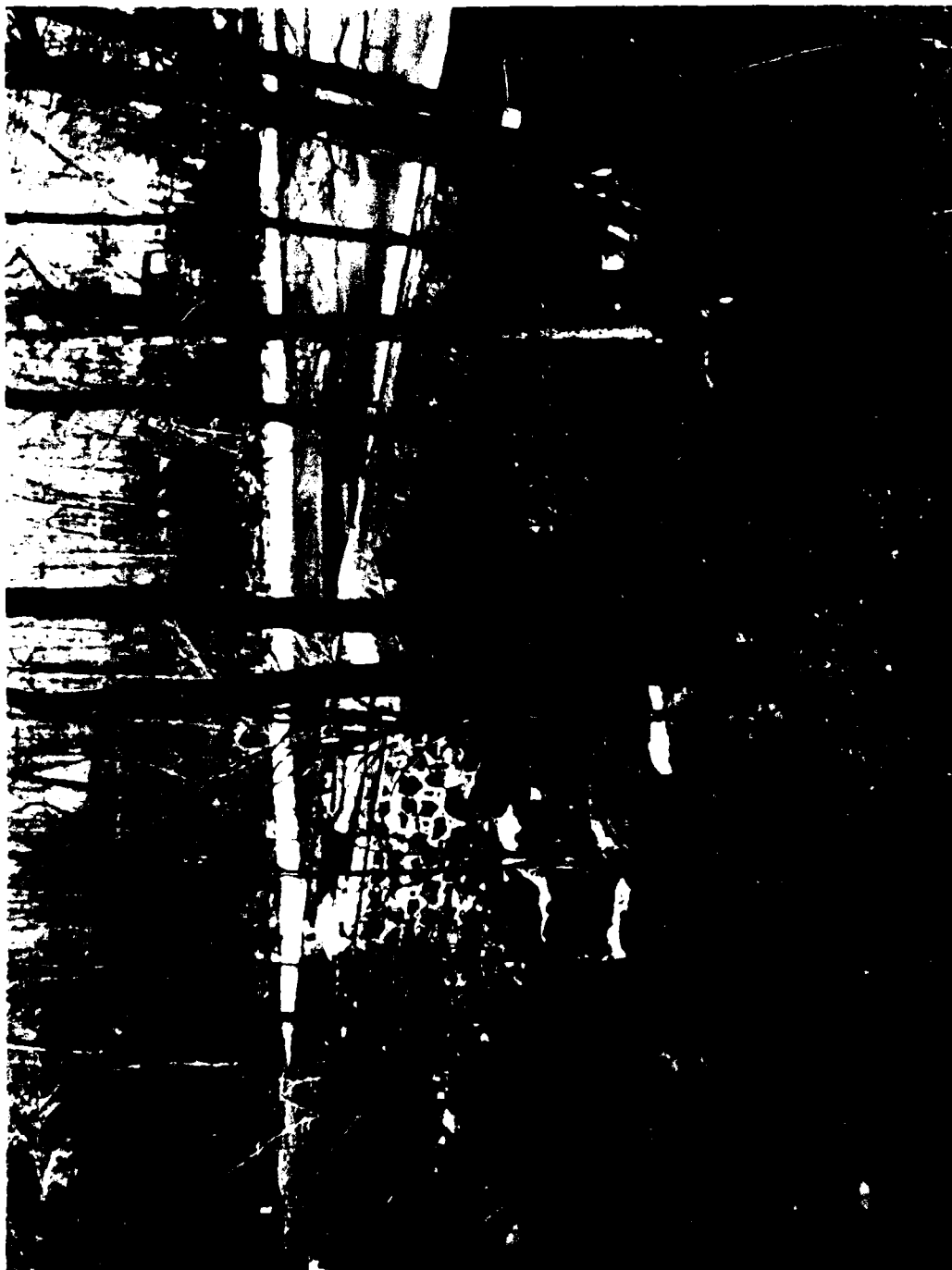
Kampfe Lake Dam is an 85-year old earth filled dam with a stone-masonry and concrete capped ungated spillway that is located near the center of the dam; the structure is in fair overall condition. The dam is small in size and should retain its high hazard classification. Several large trees are growing on the downstream slope in the left and right thirds of the dam. Considerable erosion and sloughing is noticeable near the crest on the downstream slope to the right of the spillway. The area at the downstream toe of the dam is damp and soft and some seepage water was discharging near the toe adjacent to the left drawdown pipe outlet. Two 12-inch cast iron pipes with high-level inlets serving as drawdowns, are located on each end 50 feet from the spillway retreat channel. A 16-inch cast iron pipe provides the low-level outlet located just left of the spillway. All three of these pipes have gate valves located on the downstream slope or toe of the dam. The spillway can pass 22% of the 1/2 PMF test flood without overtopping; therefore it is considered inadequate.

It is recommended that the owner retain the services of a professional engineer, qualified in the design and construction of dams, to accomplish the following in the time periods specified: Starting very soon: Investigate the cause of the seepage adjacent to the right wingwall of the spillway and investigate the cause of seepage through the mortared stone masonry spillway. In the near future: Remove the trees and brush and their roots from the downstream slope of the dam; design or specify repairs for the erosion of the upstream slope of the dam and replacement of displaced erosion protection on the upstream slope; relocate the gate valves in the 12-inch drawdown pipes to place them at or near the inlets on the upstream side of the dam; and install a 16-inch gate valve on the upstream side of the dam to control the low-level outlet; and perform a more detailed hydrologic/hydraulic evaluation of the inadequacy of the spillway and design and implement necessary corrective measures.

It is further recommended that the owner accomplish the following tasks of operation and maintenance procedures: Immediately: Start a program of periodic monitoring of the seepage and wet area along

the toe of the downstream slope; and replace flange bolts on the low-level outlet pipe and paint all exposed steel. Starting soon: develop an emergency action plan which outlines actions taken by the owner to minimize downstream effects of an emergency at the dam. In the near future: develop written operating procedures and develop a periodic maintenance plan to ensure the safety of the dam; establish a formal surveillance program for use during and immediately following periods of heavy rainfall and also a warning program to follow in case of emergency conditions; remove trees and brush for a distance of 25 feet downstream from the toe of the dam or to the property line, whichever is the lesser; and backfill animal burrows on the downstream slope of the embankment; and complete the replacement of the service bridge deck. In the future: clear trees and brush from the discharge channel and on either side of the spillway discharge channel for some distance from the spillway; and repair concrete apron at the end of left side drawdown pipe at outlet.

  
Warren A. Guinan, P.E.  
Project Manager  
New Jersey No. 16848



OVERVIEW PHOTO  
KAMPFE LAKE DAM

17 February 1981

## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C.

20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonable possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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KAMPFE LAKE DAM FED ID NO. NJ00772 NJ NO. 22-180

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PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY INSPECTION PROGRAM  
KAMPHE LAKE DAM  
FED ID NO. #NJ00772 NJ NO. 22-180

SECTION 1  
PROJECT INFORMATION

1.1 General

a. Authority. Authority to perform the Phase I Safety Inspection of Kamphe Lake Dam was received from the State of New Jersey, Department of Environmental Protection, Division of Water Resources by letter dated 12 December 1980 under Basic Contract No. FPM-39 and Contract No. A01093 dated 10 October, 1979. This Authority was given pursuant to the National Dam Inspection Act, Public Law 92-367 and by agreement between the State and the U.S. Army Engineer District, Philadelphia. The inspection discussed herein was performed by Anderson-Nichols & Company, Inc.

b. Purpose: The purpose of the Phase I Investigation is to develop an assessment of the general conditions with respect to the safety of Kamphe Lake Dam and appurtenances. Conclusions are based upon available data and visual inspection. The results of this study are used to determine any need for emergency measures and conclude if additional studies, investigations, and analyses are necessary and warranted.

1.2 Project Description

a. Description of Dam and Appurtenances. Kamphe Lake Dam is a 180-foot long rock and earthfill dam with a concrete core. The hydraulic height is 9 feet and the structural height is 10.8 feet. The downstream slope is approximately 2H:1V and the upstream slope is approximately 6H:1V. A 31-foot long broad-crested concrete spillway is located near the center of the dam. The downstream face of the spillway is of stone masonry and has a vertical drop. An undecked bridge spans the spillway. The dam has a low-level 16-inch diameter cast-iron outlet pipe through the base of the dam. Two 12-inch diameter flanged cast-iron draw down pipes with trash racks are located approximately 50 feet on either side of the spillway discharge downstream of the toe.

b. Location. The dam is located in Bloomingdale Borough, Passaic County, New Jersey on a Tributary to the Pequannock River. It is located at north latitude 41° 2.1' and west longitude 74° 20.9' on the Wanque, N.J. Quadrangle. The dam can be reached by taking the N.J. Turnpike to Rt. 46 west in



Ridgefield Park; take Rt. 46 to Rt. 23 north in Paterson; take the Newark-Pompton Turnpike in Riverdale north to the Hamburg-Paterson Turnpike; turn left and proceed for about 2 miles and turn right onto Star Lake Road. Kampfe Lake Dam is about 1.5 miles north on Star Lake Road. A location map is given in Figure 1.

c. Size Classification. Kampfe Lake Dam is classified as being small in size on the basis of storage at the dam crest of 215 acre-feet, which is less than 1000 acre-feet but more than 12.5 acre-feet, and on the basis of its structural height of 12.5 feet, which is less than 40 feet, in accordance with criteria given in the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification. Kampfe Lake Dam is immediately upstream of Star Lake Upper Dam. The latter is classified as high hazard because failure would lead to overtopping of Star Lake Lower Dam. A camp ground is located downstream of Star Lake Lower Dam and the loss of more than a few lives is possible. The failure of Kampfe Lake Dam would also overtop both Star Lake upper and lower dams, thus it is also designated as high hazard.

e. Ownership. The dam is owned by the Kampfe Lake Association. Mr. Joseph Gara, Kampfe Lake Association, Inc., Box 10, Bloomingdale, New Jersey 07403 is the caretaker of the dam. He may be reached at the above address.

f. Purpose. Kampfe Lake Dam was built for recreational purposes.

g. Design and Construction History. No information regarding the original plan or design of the dam was available. However, the Kampfe Lake Association estimates that the dam was built between 1895 and 1900. In 1974, two twelve inch pipes and valves were installed for flood control and plans for this work were made available.

h. Normal Operational Procedure. Mr. Joseph Gara, caretaker, is required to check the dam daily. He lives at the lake year round and operates the gates as necessary during storms.

i. Site Geology. No site specific geologic information (such as borings) was available at the time the dam was inspected. Information derived from the Geologic Map of New Jersey (Kummel and Johnson, 1912) and Glacial Drift Map of New Jersey (Salisbury, Kummel, Peet and Whitson, 1902) indicates soils within the immediate site consist of till of glacial origin.

The depth to bedrock at the dam site is unknown. Bedrock was observed in general outcrops on the right abutment during inspection of this dam. The previously mentioned map indicates that bedrock in the area consists of granitoid gneiss of Precambrian age.

### 1.3 Pertinent Data

a. Drainage Area

0.85 square miles

b. Discharge at Damsite (cfs)

Maximum flood at damsite - unknown

Total ungated spillway capacity at maximum pool elevation - 201

c. Elevation (ft. above NGVD)

Top of dam - 536.8

Design surcharge (1/2 PMF) - 538.3

Recreation pool (at time of inspection) - 535.0

Spillway crest - 535.0

Streambed at centerline of spillway - 526.0

Maximum tailwater (estimated)-530.6

d. Reservoir (feet)

Length of maximum pool - 2700 (estimated)

Spillway crest - 2500

e. Storage (acre-feet)

Spillway crest - 154

Design surcharge (1/2 PMF) - 272

Top of dam - 215

f. Reservoir Surface (acres)

Top of dam - 40 (estimated)

Spillway crest - 25.6

g. Dam

Type - earthfill and rockfill

Length - 180 feet

Height - 10.8 feet (hydraulic)

- 12.5 feet (structural)

Top width - 12 feet

Side slopes - upstream 6H:1V, downstream 2H:1V

Zoning - unknown

Impervious core - concrete

Cutoff - unknown

Grout curtain - unknown

h. Spillway

Type - Broad-crested concrete drop spillway with a stone masonry vertical downstream face.

Length of weir - 31 feet

Crest elevation - 535' NGVD

Low level outlet - one 16-inch cast-iron pipe  
downstream invert elevation 526.5' NGVD; upstream  
invert elevation 528.0' NGVD (estimated)

U/S Channel - Kampfe Lake

D/S Channel - Tributary to Pequannock River

i. Regulating Outlets

Type - Two 12-inch cast-iron, drawdown pipes; upstream  
invert elevations 532.7 feet NGVD left and 532.9' NGVD  
right

Length - 70' feet each

Access - Along crest of dam; all valves are located on  
downstream face and toe of dam.

## SECTION 2 ENGINEERING DATA

### 2.1 Design

No original plans, hydraulic or hydrologic data for Kampfe Lake Dam were found. However, plans and the dam application (No. 634) for the installation of the 12-inch drawdown pipes in 1974 were made available.

### 2.2 Construction

No data concerning the original construction of Kampfe Lake Dam were disclosed.

### 2.3 Operation

The gates are regulated by Mr. Joseph Gara, caretaker for the Kampfe Lake Association.

### 2.4 Evaluation

- a. Availability. A search of the New Jersey Department of Environmental Protection files and contact with a representative of the owner of the dam revealed adequate information. All available information was retrieved.
- b. Adequacy. Data obtained from visual observation and the 1974 plans were adequate to complete this Phase 1 Inspection Report.

### SECTION 3 VISUAL INSPECTION

#### 3.1 Findings

a. Dam. The crest of the dam is partially covered with grass with many areas worn bare because of pedestrian traffic. Some erosion and slumping has occurred on the upstream face which has caused displacement of portions of the riprap cover.

Considerable erosion and sloughing near the crest has occurred on the downstream slope to the right of the spillway. The surface is covered with grass and small brush. Several large trees are growing on the slope to the right of the right (west) drawdown pipe and to the left of the left (east) pipe. The area at the downstream toe of the dam is damp and soft and some seepage water was discharging near the toe adjacent to the left drawdown pipe.

Several small animal burrows were observed on the downstream slope.

b. Appurtenant Structures. The upstream concrete ungated spillway wingwalls show evidence of vertical displacement of up to 1.5 inches as noted on the left side of the spillway. Downstream from the spillway crest, the wingwalls are comprised of mortared masonry stone blocks. The masonry wall has collapsed near the toe on the righthand side. Seepage was noted flowing from between the blocks near the base of the wall. The flow varied in color from clear to slightly cloudy with no evidence of suspended fines. Several large stone blocks were observed on the bottom of the discharge channel near the toe of the vertical downstream face of the spillway which may be the remnant of a spillway apron. The wide crest of the concrete spillway is generally spalled and eroded exposing the coarse aggregate. Numerous leaks were observed in the downstream face of the spillway (mortared, masonry). The twin steel beam set in place for the service bridge are surface rusted.

The low level outlet valve located adjacent to the spillway is located on the downstream end of the outlet pipe. All flange bolts except four (4) are badly corroded. In addition, the valves for the 12-inch drawdown pipes are both located about halfway along the pipes on the downstream face of the dam.

c. Reservoir Area. The watershed above the lake is gently to moderately sloping and wooded. Slopes on the shore of the lake appear stable and some cottages are located near the waterline. No evidence of significant sedimentation was observed.

d. Downstream Channel. The channel meanders downstream from the spillway and erosion has occurred on the right and left sides of the channel for a distance of approximately 200 to 300 feet. Trees are growing within the confines of the channel as well as on the banks. The channel discharges into Upper Star Lake Reservoir.

SECTION 4  
OPERATIONAL PROCEDURES

4.1 Procedures

No formal operating procedures were revealed. However, the caretaker is required to visit the dam daily. He operates the gate valves as necessary during storms.

4.2 Maintenance of Dam

No formal maintenance procedures for the dam were found.

4.3 Maintenance of Operating Facilities

No formal maintenance procedures for the operating facilities were discovered.

4.4 Warning System

No description of any warning system was found.

4.5 Evaluation of Operational Adequacy

Because of the lack of formal operation and maintenance procedures, the remedial measures described in Section 7.2 should be implemented as described.

SECTION 5  
HYDROLOGIC/HYDRAULIC

5.1 Evaluation of Features

a. Design Data. Because no data were revealed, an evaluation could not be performed.

b. Experience Data. No experience data were found.

c. Visual Observation. The structural condition of the spillway is described in Section 3. An additional hydraulic observation is that the three gate valves of the drawdown and low-level pipes are located on the downstream side of the dam. Should one or more of these pipes rupture, the water under pressure within the dam could cause a breach or serious erosion of the embankment.

d. Kampfe Lake Dam Overtopping Potential. The hydraulic/hydrologic evaluation for the dam is based on a selected Spillway Design Flood (SDF) equal to one-half the Probable Maximum Flood (PMF) in accordance with the range of test floods given in the evaluation guidelines, for dams classified as high hazard and small in size. The PMF was determined by application of a 24-hour Probable Maximum Storm (PMS) of 27.0 inches to the SCS dimensionless unit hydrograph. Hydrologic computations are given in Appendix 4. The routed half-PMF peak discharge for the subject drainage area is 2279 cfs.

Water will rise to a depth of 1.8 foot above the spillway crest before overtopping the low point on the dam embankment crest. Under this head the spillway capacity is 201 cfs, which is less than the selected SDF.

Flood routing calculations indicate that Kampfe Lake Dam will be overtopped for 5.4 hours to a maximum depth of 1.5 feet under half-PMF conditions. It is estimated that the spillway can pass 22% of the half-PMF without overtopping the dam; thus, the spillway is considered inadequate.

Kampfe Lake Dam is upstream of and tandem to two dams, Star Lake Upper and Lower Dams. Star Lake Upper Dam was designated as high hazard based upon the fact that its failure would lead to the overtopping of Star Lake Lower Dam downstream. This could lead to severe damage of three structures just downstream of Star Lake Lower Dam and possible loss of more than a few lives (downstream area is a camp where the structures are used part of the year). Breach analysis of Kampfe Lake Dam results



in a stage on Star Lake Upper Dam reservoir of 533.1 feet NGVD. This is 0.1 foot higher than the 1/2 PMF stage used as test flood for Star Lake Upper Dam. The routed discharge at Star Lake Lower Dam is greater than that caused by failure of Star Lake Upper Dam. Four or five seasonally occupied cottages around Star Lake Upper Dam would have flooding up to their first floor elevations and the potential for additional property damage. Thus the flooding and damage caused by failure of Kampfe Lake Dam, being even more severe than Star Lake Upper Dam, cause it to also be classified as high hazard.

e. Drawdown Capacity. Assuming that the low-level outlet and drawdown pipes currently in place are in operable condition, it is estimated that the lake can be drained in approximately 8.7 days assuming no significant inflow. This time period is marginal, but adequate, considering the small drainage area for draining the reservoir in an emergency situation.

## SECTION 6 STRUCTURAL STABILITY

### 6.1 Evaluation of Structural Stability

a. Visual Observations. The soft and damp area at the downstream toe of the dam and seepage at the toe of the right wingwall of the spillway and to the left of the left gated spillway discharge pipe is indicative of seepage through and under the dam which, if not properly controlled, could lead to failure of the dam by piping or sloughing of the downstream slope. Erosion of the upstream slope of the dam which has caused displacement of the riprap at and above the waterline, which, if allowed to continue, could result in eventual breaching of the embankment. Parts of the crest of the dam which are bare of vegetation would be susceptible to erosion if the dam were overtopped. This might, in turn, lead to breaching of the dam.

Trees growing on the downstream slope and toe may cause seepage and erosion problems if a tree blows over and pulls out its roots, or if a tree dies or is cut and its roots rot. Small erosion sloughs and scarps, which are bare of vegetation, on the downstream slope near the crest are susceptible to erosion by rainfall or by overtopping of the dam; the erosion could, in turn, lead to breaching of the dam.

6.2 Design and Construction Data. No design or construction data pertinent to the structural stability of the dam are available.

6.3 Operating Records. No operating records pertinent to the structural stability of the dam were available.

6.4 Post-Construction Changes. The 1974 Dam Application #634 and accompanying plans were made available for the installation of two 12-inch drawdown pipes.

6.5 Seismic Stability - This dam is in Seismic Zone 1. According to the Recommended Guidelines, dams located in Seismic Zone 1 "may be assumed to present no hazard from earthquake, provided static stability conditions are satisfactory and conventional safety margins exist." None of the visual observations made during the inspection are indicative of unstable slopes. However, because no data are available concerning the engineering properties of the embankment and foundation materials for this dam, it is not possible to make an engineering evaluation of the stability of the slopes or the factor of safety under static conditions.

SECTION 7  
ASSESSMENT, RECOMMENDATIONS/REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. Kampfe Lake Dam is estimated to be 85 years old and is in fair condition.

b. Adequacy of Information. The information available is such that the assessment of the dam must be based entirely on the results of the visual inspection.

c. Urgency. The recommendations made in 7.2.a and 7.2.b should be implemented by the owner as prescribed.

d. Necessity for Additional Data/Evaluation. The information available from the visual inspection is adequate to identify the potential problems which are listed in 7.2.a. These problems require the attention of a professional engineer who will have to make additional engineering studies to design or specify remedial measures to rectify the problems. If left unattended, the problems could lead to failure of the dam.

7.2 Recommendation/Remedial Measures

a. Recommendations

The owner should engage a professional engineer qualified in the design and construction of dams to accomplish the following in the time periods specified.

Starting Very Soon:

- (1) Investigate the cause of the seepage adjacent to the right wingwall of the spillway and left drawdown pipe, and the soft, damp areas at the downstream toe of the dam.
- (2) Investigate the cause of seepage through the mortared stone masonry spillway.

In the Near Future:

- (1) Relocate the gate valves in the 12-inch draw-down pipes to place them at or near the inlets on the upstream side of the dam.
- (2) Install a 16-inch gate valve on the upstream side of the dam to control the low-level outlet.

- (3) Remove trees and brush and their roots from the downstream slope of the dam.
- (4) Design or specify repairs for the erosion of the upstream slope of the dam and replacement of the displaced erosion protection on the upstream slope.
- (5) Perform a more detailed hydrologic/hydraulic evaluation of the inadequacy of the spillway and design and implement necessary corrective measures.

b. Operating and Maintenance Procedures

Immediately:

- (1) Start a program of periodic monitoring of the seepage and wet area along the toe of the downstream slope.
- (2) Replace flange bolts on low level outlet pipe and paint all exposed steel.

Starting Soon:

Develop an emergency action plan which outlines actions taken by the owner to minimize downstream effects of an emergency at the dam.

In the Near Future:

- (1) Develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.
- (2) Establish a formal surveillance program for use during and immediately following periods of heavy rainfall and also a warning program to follow in case of emergency conditions.
- (3) Remove trees and brush for a distance of 25 feet downstream from the toe of the dam or to the property line whichever is the lesser.
- (4) Backfill animal burrows on the downstream slope of the embankment.
- (5) Complete the replacement of the service bridge deck.

**In the Future:**

- (1) Clear trees and brush from the discharge channel and on either side of the spillway discharge channel for a distance of 100 feet from the spillway or to the property line whichever is the lesser distance.
- (2) Repair concrete apron at end of left side drawdown pipe at outlet.

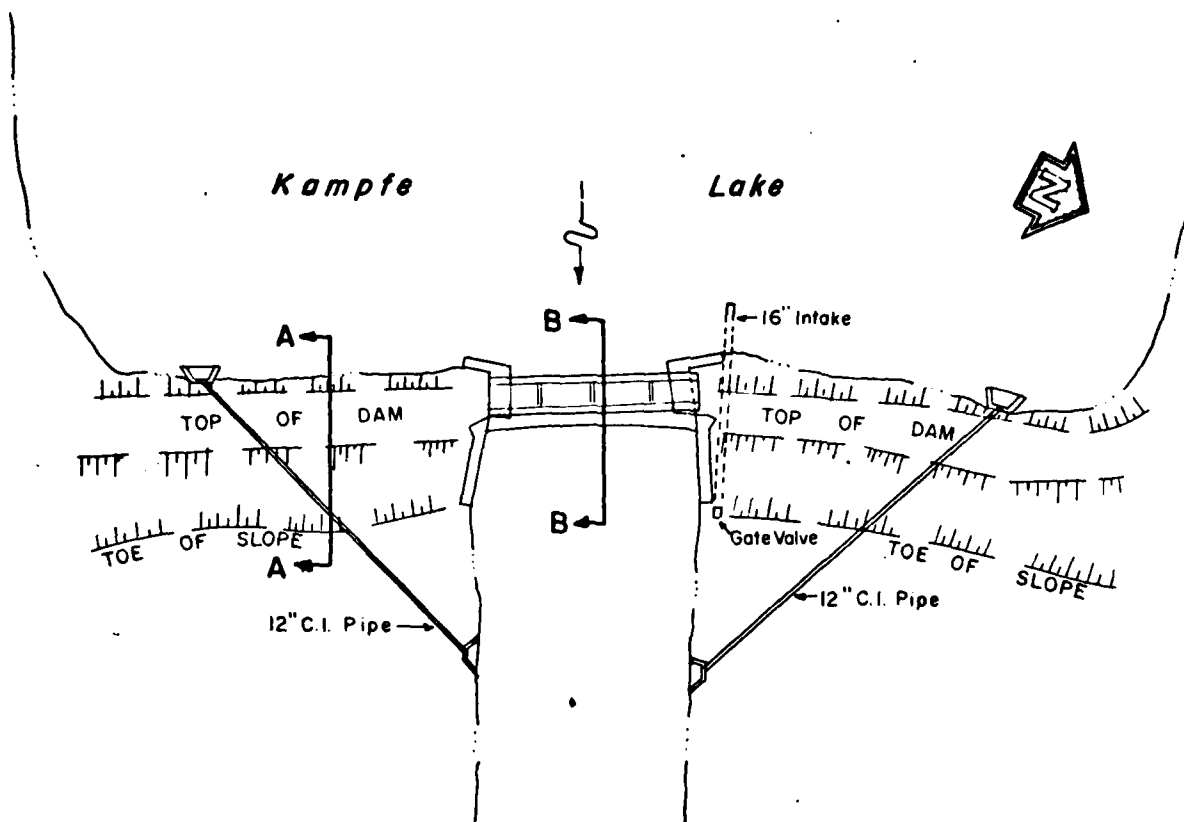


SCALE IN MILES

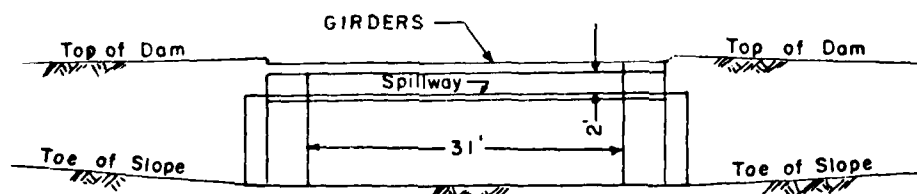


MAP BASED ON STATE OF NEW JERSEY  
OFFICIAL MAP & GUIDE.

|   |  |                                       |  |
|---|--|---------------------------------------|--|
| Anderson-Nichols & Co., Inc.                    |  | U.S. ARMY ENGINEER DIST. PHILADELPHIA |  |
| BOSTON  |  | CORPS OF ENGINEERS                    |  |
| MASSACHUSETTS                                   |  | PHILADELPHIA, PA.                     |  |
| NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS |  |                                       |  |
| KAMPFE LAKE DAM                                 |  |                                       |  |
| LOCATION MAP                                    |  |                                       |  |
| TRIB. TO PEQUANNOCK RIVER                       |  | NEW JERSEY                            |  |
|   |  | SCALE: 1" = 4 Miles Approx.           |  |
|   |  | DATE: MAY 1981                        |  |
|   |  | FIGURE 1                              |  |



PLAN

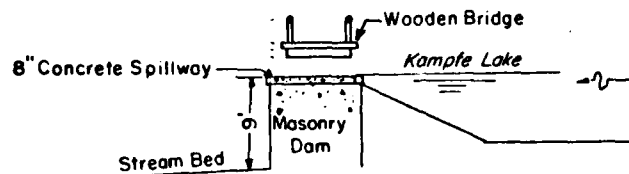


SPILLWAY  
ELEVATION

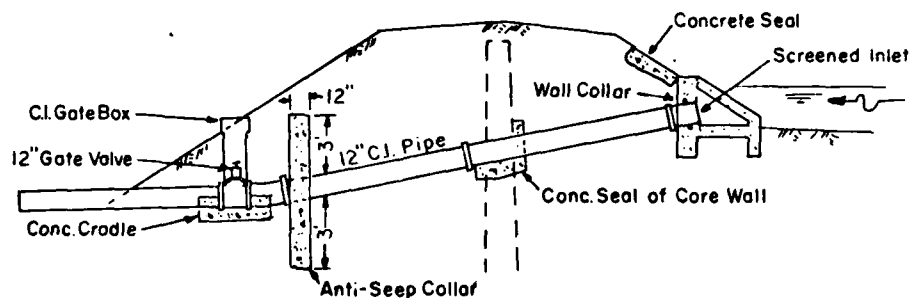
|   |               |  |  |
|---|---------------|--|--|
| Anderson-Nichols & Co, Inc                      |               | U.S. ARMY ENGINEER DIST PHILADELPHIA   |  |
| BOSTON  | MASSACHUSETTS | CORPS OF ENGINEERS<br>PHILADELPHIA, PA |  |
| NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS |               |  |  |
| KAMPFE LAKE DAM                                 |               |  |  |
| TRIB. TO PEQUANNOCK RIVER                       |               | NEW JERSEY                             |  |
|   |               | SCALE NOT TO SCALE                     |  |
|   |               | DATE MAY 1961                          |  |
|   |               | FIGURE 2                               |  |



SECTION A-A



SECTION B-B



PIPE DETAIL

|  |  |                                      |  |
|--|--|--------------------------------------|--|
| Anderson-Nichols & Co., Inc.                   |  | U.S. ARMY ENGINEER DIST PHILADELPHIA |  |
| BOSTON   |  | CORPS OF ENGINEERS                   |  |
| MASSACHUSETTS                                  |  | PHILADELPHIA, PA.                    |  |
| NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS |  |                                      |  |
| KAMPFE LAKE DAM                                |  |                                      |  |
| X-SECTIONS                                     |  |                                      |  |
| TRIB TO PEQUANNOCK RIVER                       |  | NEW JERSEY                           |  |
|  |  | SCALE NOT TO SCALE                   |  |
|  |  | DATE MAY 1901                        |  |
|  |  | FIGURE 3                             |  |



APPENDIX I  
ENGINEERING AND EXPERIENCE DATA  
KAMPFE LAKE DAM

Form 15-36-5-59

Dam Application No. 614

Map No. 27-180

State of New Jersey  
Division of Water Policy and Supply

REPORT ON DAM APPLICATION

Application of Kampfe Lake

Dated November 13, 1973 for approval of plans and for a permit to 2-12' Draw-Down Lines in

a dam for the impoundment of Kampfe Lake across an unnamed

tributary to Pequannock River in Borough of Bloomingdale

County, New Jersey, has been examined by William F. Rogers, Principal Engineer

PRINCIPAL FEATURES

|   |  |                     |   |
|---|--|---------------------|---|
| Purpose of dam                          | Recreation   | Type of dam         | Rock and earth fill with concrete core wall |
| Site inspected                          |  | Foundation material |   |
| Location:                               | 22 x 35 x 7 x 2 x 5                                    | Maximum height      | 16 feet                                     |
| Drainage area                           | 0.85 sq. mi.   | Length of dam       | 300 feet                                    |
| Elevation of flow line                  | 535.0  | Top width of dam    | 8 feet                                      |
| Area of lake                            | 32 acres   | Downstream slope    | 1:4   |
| Capacity of lake                        | 52 million gallons                                     | Upstream slope      | 1:2   |
| Type of spillway                        | Broad Crest Drop                                       |                     |   |
| Length of spillway                      | 60   |                     |   |
| Design Flood Flow                       | 850 cubic feet per second = 1000 sec. ft. per sq. mi.  |                     |   |
| Head on spillway for design Flood Flow  | 3.61 feet - will overtop embankment.                   |                     |   |
| Freeboard                               | None feet Top of dam 2.8 ft. above spillway elevation. |                     |   |
| Maximum spillway capacity (dam overtop) | = 350 cubic feet per second                            |                     |   |
|   | = 411 sec. ft. per sq. mi.                             |                     |   |
| Outlet other than spillway              | None   |                     |   |
| Drawings filed by                       | J. Baldo Rade & Associates, Inc.                       |                     |   |

DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DIVISION OF WATER POLLUTION CONTROL  
BUREAU OF WATER CONTROL  
P.O. BOX 2500  
TRENTON, NEW JERSEY 08646 1276 MAR 18 PM 12 15

COMMITTEE REPORT FORM

Dam Application No. 634 Date of Inspection 2/27/76  
Name of Dam Kanawake Lake  
Owner's Name Kanawake Lake Association, Inc.  
Address Kanawake Lake, Box 10, Bloomingdale, New Jersey 07403

Comment on the following items in accordance with the instructions enclosed:

A. Earthfill and/or Other Dams

1. Maintenance

Embankment slopes and the crest of dam adequately maintained

2. Condition

No evidence of seepage or signs of deterioration. Lake elevation had been lowered as directed by U.S. Dept. of Environment of Environmental Protection

3. Other

Spillway has several openings in masonry blocks

B. Masonry and Concrete Dams

1.

2.

3.

4.

5.

C. Channels, Stillings Facilities and Surrounding Areas

1. No channel bed erosion or silting
2. No riprap areas
3. No excessive amount of undergrowth in channel
4. No aggradation of stream bed
5. No abnormal subsidence of embankment area
6. No unusual operational behavior

D. Mechanical Equipment

1. Inlet and outlet works and valves functioning.  
All valves were open.
2. No trash racks

E. Miscellaneous

1. No record of flood waters overtopping dam
- 2.

November 14, 1975

Karpis Lake Associates, Inc.  
P.O. Box 10  
Bloomington, NJ 07403

Attention: George Monroe, Jr., Secretary

Re: Dam No. 634, Karpis Lake

Gentlemen:

This is with reference to the condition of Karpis Lake Dam across an unroad tributary of the Passaic River located 3000 feet downstream or southerly of Glenwild Avenue in the Borough of Bloomington, Passaic County, New Jersey.

A recent investigation of the dam made by a member of my staff indicates that there are numerous seepage points through the earthen embankment. Since recent construction revealed that a concrete core wall as shown on the drawings in our file, in fact does not exist, the seepage is potentially dangerous. Therefore, you must know the water elevation of the lake at least one foot below the spillway and have a N.J. Professional Engineer inspect the structure and prepare an Engineering Report in accordance with the enclosed.

The report along with recommended repairs should be submitted to this office within sixty (60) days.

Very truly yours,

Dirk C. Hoffman, P.E.  
Chief, Bureau of Flood Plain  
Management

cc: Mr. Clark

cc: Borough Engineer  
Borough Clerk

ENCLOSURE

October 9, 1973

TO WHOM IT MAY CONCERN:

Pursuant to section 2315-27 of the Revised Statutes,  
permission is hereby granted to

George Kurose, Jr., Secretary  
Kampf's Lake Assn  
P.O. Box 10  
Bloomingdale, NJ

to draw off the waters of Kampf's Lake, located at Glenwild Ave.,  
Bloomingdale, NJ, under the supervision of Conservation Officer Arthur  
Wandelken provided measures are taken to prevent the destruction of  
any fish.

This permit is issued by the Division of Fish, Game and  
Shellfisheries for the purpose of salvaging and protecting fish life  
and for no other purpose.

This permit expires May 15, 1976.

Russell A. Cunningham, Director

RAC:mr  
cc Fishery Lab.  
CO Mendelken  
Water Resources

Dam No. 634

Kampfe Lake

Inspection Report

October 7, 1975

At about 1030 hours an inspection of the spillway and embankment of the dam was made in company with Mr. Kitchell, Contractor, who installed the two new 12 in. drawdown lines.

The inspection was made at the request of Mr. Kitchell since some people of the Kampfe Lake Association were intimating that the seepage through the dam was due to the disturbance caused by Mr. Kitchell during his construction of the drawdown lines.

Mr. Kitchell noted that at neither end of the dam embankment during his cut through the embankment did he encounter the core wall shown on the approved drawings.

Also, a careful investigation of the upstream face of the embankment under the small riprap, indicated a multitude of small voids and slumps under the riprap. The major portion of the embankment appears to be sand and gravel and it is the opinion of the writer that the poor compaction and material of the original embankment has led to multitudinous seepage paths developing.

Recommendations Possible:

1. That a core wall be installed. (This is not feasible cost wise)
2. That pressure grouting of the entire structure be undertaken. (This also may not be logical conclusion)
3. That a clay blanket and heavy riprap be installed on the upper face of the entire embankment and spillway along with pressure grouting of the spillway section.

*integrated*

PHONE LOG

Dam 634

10/2/75 Per phone conversation with Mr. Warren Kitchell, Builder & Contractor for installation of pipes in Kampfe Lake Dam. He stated that he found that there was no core wall in the embankment as indicated on submitted drawings and that there was a leak along one of the pipes installed. He notes that there were various areas of subsidence on the upstream side of the dam and in some parts of the embankment indicating that there may be seepage paths. Altogether

10/3/75 At 12:30 hours in call to 201.728.3022 he advised that water level of lake was down about 1 foot to take head off embankment. Call was made to Mr. Joe Farn from this office at 12:45 hours to 201.838.1666. Sny of Kampfe Lake Assoc. for advise that lake should be kept lowered until positive repairs could be made. Advised Mr. Kitchell that inspection will be made on Tuesday 10/7/75 at 11:00 AM.



June 1957 112  
(22-100) 11274

June 1957 112

25 10

Blowing Rock, N.C. 27403

112 on August 10, 1973

The ... of ...  
dam and ... lines, one on each side of  
the ... of ... lake  
... an ... of  
the ... River ...  
... of ...  
in the ... of ...  
... , ...

Location 22-25-7-215  $\square$   
(22-25-7-215)

1.1 = 1.85

2.1 = 1.15

3.1 = 1.15

4.1 = 1.15

5.1 = 1.15

1.)

..



7

- # h



Very truly  
Dick C. Hooper

Dirk C. Hoffman, P.E.  
Chief, Bureau of Water

18

Values.  
 1000 ft. to Brown Collier Co.  
 1000 ft. to 500 ft. - 1000  
 1000 ft. to 500 ft. - 1000  
 1000 ft. to 500 ft. - 1000

Branch Office  
718-2043



**G. WALDO RUDE  
AND  
ASSOCIATES, INC.**  
Engineers-Land Surveyors  
38 COLONY AVENUE  
POMPTON LAKE, N. J. 07424

Since 1957  
BB-3188-9

November 29, 1974

Charles Rude  
Charles L. Rude  
William O. Dugan  
William R. Ryle  
Harry A. Rude

REC-1  
DEC 5 1974

DEPT. OF ENVIRONMENTAL PROTECTION  
DIVISION OF PERMITS

Mr. William F. Rogers  
Department of Environmental Protection  
P.O. Box 2809  
Trenton, N.J. 08625

Re: Kampfe Lake Associates Inc.  
Bloomingdale, N.J.  
Dam Application Permit No. 634

Dear Mr. Rogers:

This is to certify that the above project has been constructed in conformance with the drawings and specifications as approved. The Contractor started construction on November 8, 1974, and completed the installation on November 19, 1974. The work was inspected on a daily basis by this office.

Very truly yours,

G. WALDO RUDE & ASSOCIATES, INC.

*Harry A. Rude*  
Harry A. Rude

HAR/RE

cc: Mr. Joe Gara

Preliminary Calculations Dam 634 WKC  
(22-130) 1/28/74  
For existing Dam and Spillway

$$Q_{100} = 850, L = 40 \text{ ft.}, C = 3.1$$

It should be noted that the maximum head on the spillway will be 2 feet due to proximity of steel bridge over spillway.

Maximum Over existing Spillway

$$Q = 3.1 \times 10 \times 2^{3/2} (2.83)$$

$$Q = 350 \text{ csc. ft.}$$

Total freeboard above spillway elevation is 2.3 feet.

This permit will be for work on drainage lines only and at such time that any work is performed on the spillway, further drawings and permit will be necessary.

STATE OF NEW JERSEY  
Department of the Treasury  
P.O. Box 200  
Trenton, N.J. 08646

PERMIT APPLICATION FORM NO. 636

In accord with the provisions of N.J.S.A. 13:27 of the Revised Statutes, this permit is issued for the project indicated, to the below-named applicant, subject to all the terms and conditions attached hereto.

Maple Lake Associates Inc.  
Box 20  
Blowingdale, N.J. 07803

**PROJECT:** The construction of two 12 inch unwe-dam lines and valves, one on each side of the existing spillway of Maple Lake Dam across an unimproved tributary of the Raritan River located 3,000 feet downstream or southeasterly of Glenville Avenue in the Borough of Blowingdale, Sussex County, New Jersey.

Approval:

July 10, 1974  
Permit

*Rich C. M.*  
Rich C. M., County Engineer  
Trenton, N.J. 08646

Attest:

*Lyette H. Burr*

THE APPLICANT(S) AND ALL FOLLOWING HEIRS, ASSIGNS OR SUCCESSORS MUST ABIDE BY AND FULFILL THE TERMS AND CONDITIONS OF THIS PERMIT AS HEREIN WRITTEN AND ENFORCED BY THE DIVISION OF WATER RESOURCES. All property encompassed within this permit must be owned by the applicant and/or proper consents, rights of way and other agreements shall have been obtained for the work outside of property owned by the applicant.

Witness my hand and seal this *William F. Rogers*

Certified File No. 16F-206

KAMPFE LAKE  
Dam Number 614  
Passaic County  
Inspection Report

On May 28, 1974 an inspection was made of Kampfe Lake Dam across an unnamed tributary located 3000 feet downstream or southerly of Glenwild Avenue in the Borough of Bloomingdale, Passaic County.

Inspection was made to determine condition of structure in connection with the installation of 2-12 inch draw-down lines and valves, one on each side of the existing spillway.

The condition of the total embankment, spillway and wingwalls is good with no evidence of defects that might need repair.

The embankment is about 180 feet long with a top width of from 10 to 12 feet. Upstream side slope is about 1 on 2 and riprapped with no evidence of erosion from wave action. Downstream side slope is about 1 on 1 with no seepage or leaking evident. The general condition of the upstream and downstream wingwalls and the spillway is good. The downstream wingwalls and spillway are mortared stone with a concrete capped spillway section.

General topography in the area is fairly steep and warrants the use of North Jersey Curve for run-off calculations. The surface area of the lake is about 30 acres with no upstream bodies of water.

*William F. Govers*

William F. Govers  
Principal Engineer  
Dam Analysis Section

WFR:L:CS

cc: Mr. Dirk C. Hofman

# DOWNSTREAM - 1 DAMS IN NEW JERSEY—REFERENCE DATA

PEQUANNOCK RIVER  
No. 22-52

Name of Owner: Salvation Army Inc. Address: 122 W. 14th St., N.Y.C.  
Name of Dam: Star Lake County: Morris Location: 22.35.7.2.B  
CONSTRUCTION: Date: About 1900 By whom: Star Safety Razor Co.  
Stream: Nameless branch Tributary to: Pequannock River  
DRAINAGE BASIN: Area: 0.6 sq. mi. Description: Hilly, wooded.  
Description of valley below dam: Steep, uninhabited. 2nd. pond immediately below.  
DAMAGE FROM FAILURE: Probable: None

Previous (date): \_\_\_\_\_  
Purpose: Recreation Type: Dry rubble wall and earth fill.  
Foundation: \_\_\_\_\_  
Length: 215 ft. Max. height: 8.0 ft. Max. width of base: Top 10 ft.  
Upstream slope: 1:2 Downstream slope: Vertical Volume: Cu. yds.  
SPILLWAY: Type: Concrete weir Length: 49.5 ft.  
Depth below top of wall: 2.5 ft. Capacity: 700 c. f. s. per sq. mi.  
RESERVOIR: Capacity: \_\_\_\_\_ mill. gals. Area: \_\_\_\_\_ acres. Length: \_\_\_\_\_ ft.  
Outlet: One 18" concrete pipe with wood gate which cannot be operated.  
Remarks: \_\_\_\_\_

Sources of data: Inspection and conf. Major Brinley. J.H.B. Date: 7/14/'27

# DOWNSTREAM - 2 DAMS IN NEW JERSEY—REFERENCE DATA

PEQUANNOCK RIVER  
No. 22-53

Name of Owner: Salvation Army Inc. Address: 122 W. 14th St., N.Y.C.  
Name of Dam: Star Lake No. 2 County: Morris Location: 22.35.7.5.2  
CONSTRUCTION: Date: About 1900 By whom: Star Safety Razor Co.  
Stream: Nameless Branch Tributary to: Pequannock River  
DRAINAGE BASIN: Area: 0.6 sq. mi. Description: Hilly, wooded.  
Description of valley below dam: Steep, uninhabited.  
DAMAGE FROM FAILURE: Probable: None

Previous (date): \_\_\_\_\_  
Purpose: Recreation Type: Rubble masonry, gravity section.  
Foundation: \_\_\_\_\_  
Length: 175 ft. Max. height: 15 ft. Max. width of base: Top 4.5 ft.  
Upstream slope: \_\_\_\_\_ Downstream slope: \_\_\_\_\_ Volume: \_\_\_\_\_ Cu. yds.  
SPILLWAY: Type: Two masonry notches Length: 1-30 1-24 & 54 ft.  
Depth below top of wall: 0.9 ft. Capacity: 108 c. f. s. per sq. mi.  
RESERVOIR: Capacity: \_\_\_\_\_ mill. gals. Area: \_\_\_\_\_ acres. Length: \_\_\_\_\_ ft.  
Outlet: 1-12" Cast iron pipe to water supply.  
Remarks: \_\_\_\_\_

Sources of data: Inspection J.H.B. Date: 7/14/'27

# DOWNSTREAM - 3

PEQUANNOCK RIVER

DAMS IN NEW JERSEY—REFERENCE DATA NO. 22-10

Name of Owner Cold Spring Lake Co. Address Blomington, N. J.  
 Name of Dam Cold Spring Lake County Passaic Location T2.35.7.0.2  
 CONSTRUCTION: Date About 1900 By whom John F. Blasco (Deceased)  
 Stream A small stream Tributary to Pequannock River  
 DRAINAGE BASIN: Area 1.42 sq. mi. Description  
 Description of valley below dam Highways 250 ft. below (Box culvert 30" high 15' wide)  
 DAMAGE FROM FAILURE: Probable Dam in good shape.  
 Previous (date) 1903 gate went around right end (now replaced with 60" gate)  
 Purpose Recreation and ice pond Type Rock and concrete wall, earth fill.  
 Foundation  
 Length 300 ft. Max. height 16 ft. Max. width of base  
 Upstream slope 2:1 Concrete Downstream slope 1:1 Gravel Volume Cu. yds  
 SPILLWAY: Type 1 Masonry 2:1 2:1 2:1 Length 107 ft.  
 Depth below top of concrete core wall 1.67 ft. Capacity 26 c.f.s. per sq. mi.  
 RESERVOIR: Capacity mill. gals. Area 15 acres. Length  
 Outlets  
 Remarks Average depth 9 feet  
 Sources of data A. C. White (Pequannock Valley Paper Co.) J. L. S. on ground Date 11/6/23



APPENDIX 2  
CHECK LIST  
VISUAL INSPECTION

KAMPFE LAKE DAM

Check List  
Visual Inspection  
Phase 1

Name Dam Kampfe Lake Dam (NJ00772) County Passaic State NJ Coordinators NJDEP  
 Date(s) Inspection 2/17/81 4/23/81 Weather Rain Warm, ptly cloudy Temperature 50° 55°  
 Pool Elevation at Time of Inspection 533' 535' NGVD Tailwater at Time of Inspection 527' None NGVD

Inspection Personnel:

|               |                |
|---------------|----------------|
| <u>Stuart</u> | <u>Gilman</u>  |
| <u>Deane</u>  | <u>Guinan</u>  |
| <u>Plaud</u>  | <u>Murdock</u> |

Stuart, Gilman Recorder

Mr. Joseph Gara, caretaker, was present  
at both inspections

# UNGATED SPILLWAY

| VISUAL EXAMINATION OF          | OBSERVATIONS   | REMARKS OR RECOMMENDATIONS |
|--------------------------------|--|----------------------------|
| CONCRETE WEIR                  | <ul style="list-style-type: none"> <li>- Wide crest is generally spalled and eroded exposing the coarse aggregate, Max. depth 1/2-in.</li> <li>- Downstream face (mortared masonry) is leaking in numerous places.</li> <li>- Recently repaired concrete in fair shape - Spillway abutments recently repointed.</li> </ul>                 | Repair eroded concrete     |
| APPROACH CHANNEL               | <p>Poured concrete blocks adjacent to u/s wing walls have settled and moved away from the wing walls.</p> <p>Clear - unobstructed</p>  |                            |
| DISCHARGE CHANNEL              | Clear, rocky channel 6-in - 8-in trees 100 ft d/s  |                            |
| BRIDGE AND PIERS OVER SPILLWAY | <ul style="list-style-type: none"> <li>- Recently poured concrete abutments - good condition.</li> <li>- Twin "I" beams for bridge deck are rusted thru paint, bracing angles are surface rusted.</li> <li>- No deck</li> <li>- Cantilevered walkway on left of spillway is in good condition - Wood deck is surface weathered.</li> </ul> |                            |

OUTLET WORKS  
(Two 12-in drawdown pipes)

| VISUAL EXAMINATION OF  | OBSERVATIONS   | REMARKS OR RECOMMENDATIONS |
|--|--|----------------------------|
| CRACKING AND SPALLING OF<br>CONCRETE SURFACES IN OUTLET<br>CONDUIT | Not visible. New outlet pipes<br>and concrete wingwalls.   |                            |
| INTAKE STRUCTURE   | Intake pipes, wingwalls and<br>trash racks, new and in good<br>condition.  |                            |
| OUTLET PIPE  | New - good condition   |                            |
| OUTLET CHANNEL   | Rocky, brushy channel. Concrete<br>aprons, surface eroded 1/2-in deep.<br>Left side apron is crumbling. Left<br>side outlets approximately 30-ft d/s<br>toe. Right side outlets approximately<br>50-ft d/s toe | Repair concrete apron.     |
| EMERGENCY GATE   | Not applicable   |                            |

OUTLET WORKS  
(16-in pipe)

| VISUAL EXAMINATION OF  | OBSERVATIONS   | REMARKS OR RECOMMENDATIONS  |
|--|--|---|
| CRACKING AND SPALLING OF<br>CONCRETE SURFACES IN OUTLET<br>CONDUIT | Not applicable   |   |
| INTAKE STRUCTURE   | Not visible  |   |
| OUTLET PIPE  | 16-in valve on d/s end. All flange bolts connecting valve are badly corroded except for 4 bolts. Valve leaking slightly. Pipe and valve rusting. | Replace badly corroded bolts.<br>Clean and paint valve.<br>Relocate valve to upstream side. |
| OUTLET CHANNEL   | See "UNGATED SPILLWAY DISCHARGE CHANNEL"   |   |
| EMERGENCY GATE   | Not applicable   |   |

# DOWNSTREAM CHANNEL

| VISUAL EXAMINATION OF                         | OBSERVATIONS   | REMARKS OR RECOMMENDATIONS |
|---|--|----------------------------|
| CONDITION<br>(OBSTRUCTIONS,<br>DEBRIS, ETC.)  | Clear, rocky channel 6-in - 8-in<br>trees.   |                            |
| SLOPES  | Gentle slopes, watershed<br>steeply sloping.                                       |                            |
| APPROXIMATE NO.<br>OF HOMES AND<br>POPULATION | 3 camp buildings are downstream<br>of Star Lake - population varies<br>with season | High Hazard                |

Note: Caretaker required to check dam daily by Owners. Lives at the lake year-round.  
Operates gate valves as necessary during storms.

# RESERVOIR

## VISUAL EXAMINATION OF

## OBSERVATIONS

## REMARKS OR RECOMMENDATIONS

### SLOPES

On the shore of the lake, slopes appear stable and are gently to moderately sloping. 17 private homes.

### SEDIMENTATION

No evidence of significant sedimentation was observed.

CHECK LIST  
ENGINEERING DATA  
DESIGN, CONSTRUCTION, OPERATION

| ITEM                       | REMARKS   |
|----------------------------|---|
| PLAN OF DAM                | None found. Information available from plan #634 done for the installation of 2 - 12-in. drawdown lines. The plan is available from NJDEP files, filed 16 August 1973 for NJ dam #22-180, or Fed. ID No. NJ00772. |
| REGIONAL VICINITY MAP      | Prepared for this report  |
| CONSTRUCTION HISTORY       | None found  |
| TYPICAL SECTIONS OF DAM    | Available from plan #634 in NJDEP files. See PLAN OF DAM above.<br>Used for typical section figure in report.   |
| HYDROLOGIC/HYDRAULIC DATA  | None found  |
| OUTLETS - PLAN             | Plan #634 available in NJDEP files. See PLAN OF DAM above.  |
| - DETAILS                  | Same as above   |
| - CONSTRAINTS              | None found  |
| - DISCHARGE RATINGS        | None found  |
| RAINFALL/RESERVOIR RECORDS | None found  |



| ITEM  | REMARKS                          |
|---|----------------------------------|
| DESIGN REPORTS  | None found                       |
| GEOLOGY REPORTS   | None found                       |
| DESIGN COMPUTATIONS<br>HYDROLOGY & HYDRAULICS<br>DAM STABILITY<br>SEEPAGE STUDIES | None found                       |
| MATERIALS INVESTIGATIONS<br>BORING RECORDS<br>LABORATORY<br>FIELD                 | None found                       |
| POST-CONSTRUCTION SURVEYS OF DAM  | See PLAN OF DAM on previous page |
| BORROW SOURCES  | Unknown                          |

| ITEM  | REMARKS  |
|---|--|
| MONITORING SYSTEMS                                    | None   |
| MODIFICATIONS   | Two 12-inch drawdown lines were constructed through the existing dam in 1974. See PLAN OF DAM on page 2-7.             |
| HIGH POOL RECORDS                                     | None   |
| POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS     | Some information available in NJDEP files. Legible sheets are included in Appendix 1, ENGINEERING and EXPERIENCE DATA. |
| PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS | Unknown  |
| MAINTENANCE OPERATION RECORDS                         | None   |

| ITEMS                                  | REMARKS   |
|--|---|
| SPILLWAY PLAN                          | Available on 1974 plan of installation of 2 12-inch drawdown lines.<br>See PLAN OF DAM on page 2-7. |
| SECTIONS                               | Same as above   |
| DETAILS                                | None available  |
| OPERATING EQUIPMENT<br>PLANS & DETAILS | Some information in 1974 plan mentioned above.  |

CHECK LIST  
HYDROLOGIC AND HYDRAULIC DATA  
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 0.85 square miles, steep slope, woods,  
homes

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 535' NGVD (154 acre-  
feet)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY) Not applicable

ELEVATION MAXIMUM TEST FLOOD POOL: 538.3' NGVD (1/2 PMF)

ELEVATION TOP DAM: 536.8' NGVD

SPILLWAY CREST: Free overflow concrete spillway

- a. Elevation 535' NGVD
- b. Type Broad crested concrete spillway with vertical drop
- c. Width 7 feet
- d. Length 31 feet
- e. Location Spillover Center of dam
- f. Number and Type of Gates None

OUTLET WORKS: Two high-level draw-down pipes (with trash racks);  
one low-level outlet pipe

- a. Type Two 12-inch cast-iron and one 16-inch cast-iron flanged  
pipes.
- b. Location High level pipes are 50 feet on either side of  
spillway; low-level outlet is about 10 feet left (east of  
spillway
- c. Entrance Inverts High-level: Left 532.7' NGVD; Right  
532.9' NGVD low-level 528' NGVD (estimated)
- d. Exit Inverts High-level: Left 527.0' NGVD; Right 527.4'  
NGVD low-level 526.5' NGVD

HYDROMETEOROLOGICAL GAGES: • None

MAXIMUM NON-DAMAGING DISCHARGE: 201 cfs

APPENDIX 3

PHOTOGRAPHS

KAMPFE LAKE DAM



April 23, 1981

View looking u/s from below dam at overflow spillway



April 23, 1981

View looking west over spillway and bridge girders



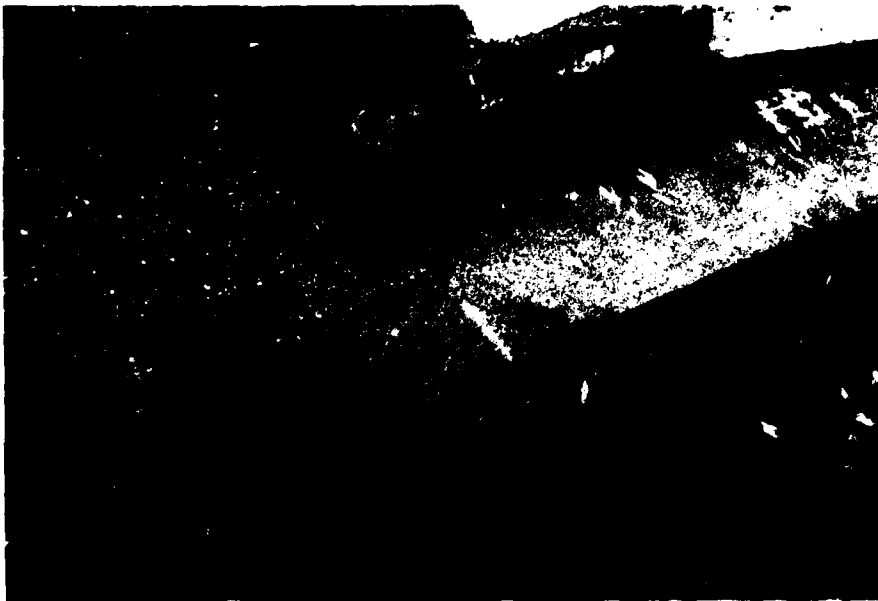
February 17, 1981

Upstream face looking into high level outlet intake and bar screen for 12-in pipe on right (west) side of dam.



April 23, 1981

Head wall and 12-in CIP on west (right) side looking up along cover over pipe to dam crest. Valve box located on d/s side just below crest.



April 23, 1981

View of cracked concrete anchorage for cantilevered walk used to raise and lower screen over blow-off pipe inlet.



April 23, 1981

View of 16-in pipe and valve (blow-off) near d/s toe of dam.





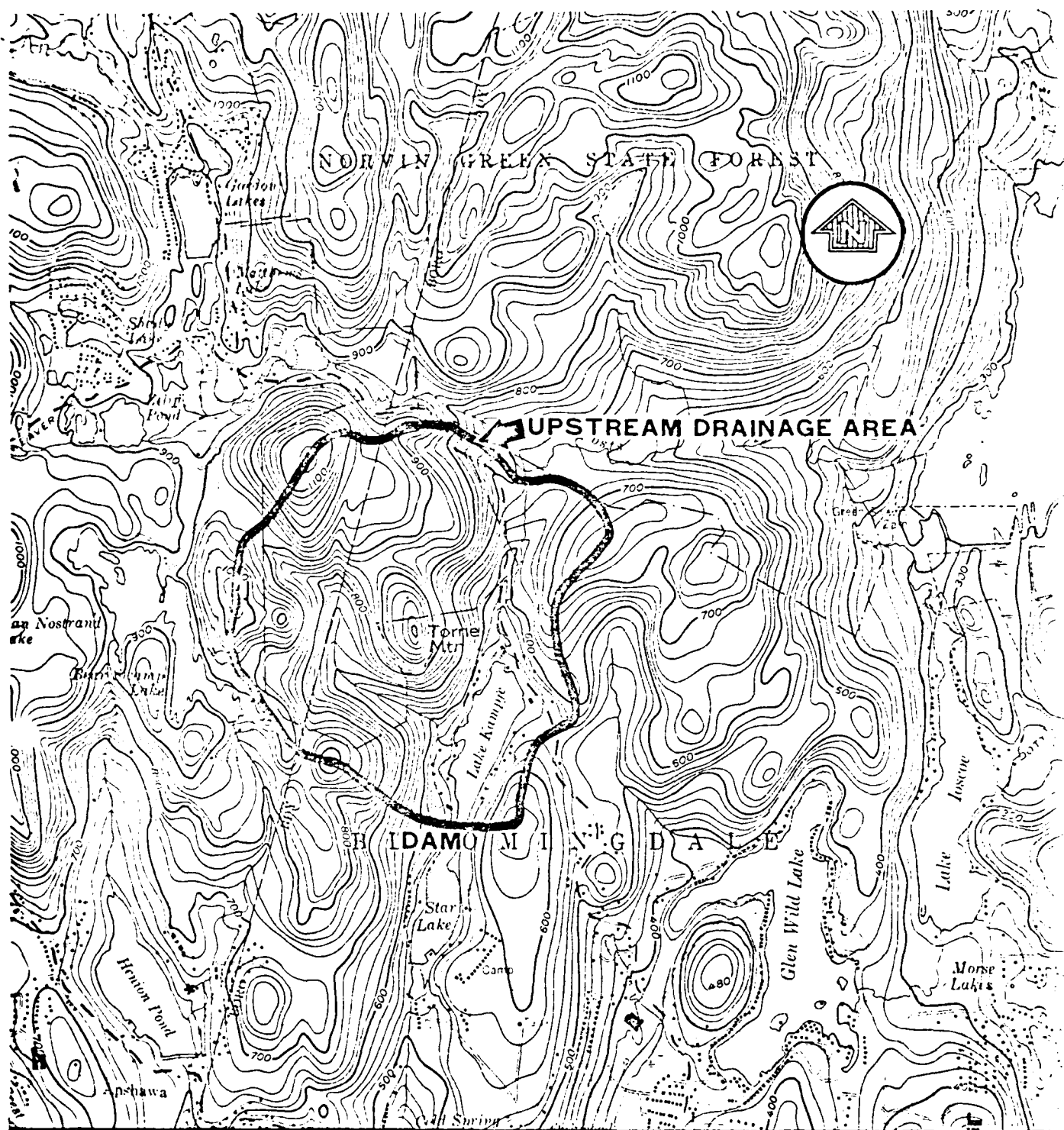
April 23, 1981

View of downstream channel

APPENDIX 4

HYDROLOGIC COMPUTATIONS

KAMPFE LAKE DAM



**NATIONAL PROGRAM OF INSPECTION OF  
NON-FED. DAMS**

**LAKE KAMPFE DAM  
BLOOMINGDALE BORO, NEW JERSEY  
REGIONAL VICINITY MAP**

**MAY 1981**

**DEPARTMENT OF THE ARMY  
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS  
PHILADELPHIA, PENNSYLVANIA**

Anderson-Nichols & Company, Inc.

BOSTON, MA.

**SCALE IN MILES**



**MAP BASED ON U.S.G.S. 7.5 MINUTE QUADRANGLE  
SHEET WANAQUE, N.J. 1954, REVISED 1971.**

JOB NO.

SQUARES  
1/4 IN. SCALE

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

## Time of Concentration

1. Texas Highway Method

reach length 2200'

overland

$$\text{slope} = \frac{1130 - 740}{2200} = .17 = 17\%$$

ave vel. 3.5 ft./sec

reach length 3000'

channel

$$\text{slope} = \frac{740 - 520}{3000} = .07 = 7\%$$

ave vel. 5 ft./sec

$$\frac{2200 \text{ ft}}{3.5 \text{ ft./sec}} + \frac{3000 \text{ ft}}{5 \text{ ft./sec}} = \underline{\underline{20 \text{ min.}}}$$

2. Soil & Water Conservation

$$L = 0.6 t_c \quad L = \frac{10.8 (S+1)^{1.67}}{9000 Y^{0.5}}$$

$$S = \frac{1000}{CN} - 10$$

Take CN = 70 for woods

$$S = \frac{1000}{70} - 10 = 4.3$$

$$L = 2200 + 3000 = 5200$$

$$Y = \frac{1130 - 520}{5200} = .12 = 12\%$$

$$L = \frac{(5200)^{0.8} (4.3+1)^{1.67}}{9000 (.12)^{1/2}} = 0.49 \text{ hrs.}$$

$$T_c = \frac{0.49}{0.6} = .81 \text{ hrs} = \underline{\underline{49 \text{ min}}}$$

JOB NO.

SQUARES 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30  
1/4 IN. SCALE3. SCS TR = 55overland

$$L = 2200 \text{ slope} = 17\%$$

$$\text{from fig. 3-1 Page 3-2 } V = 1.0 \text{ ft/sec}$$

$$T_c = \frac{2200 \text{ ft}}{1 \text{ ft/sec}} = 37 \text{ min}$$

Channel

$$L = 3000 \quad h = 220$$

$$S = .07 \quad n = .04$$

$$V = \frac{1.49}{n} 12^{2/3} S^{1/2}$$

(Assume a 10' x 1' rectangular channel  
to calculate R)

$$R = \frac{A}{wp} = \frac{10}{20 + 10} = 0.83 \text{ ft}^2$$

$$V = \frac{1.49}{.04} (.83)^{2/3} (.07)^{1/2} = 8.7 \text{ ft/sec}$$

$$T_c = \frac{3000 \text{ ft}}{8.7 \text{ ft/sec}} = 5.7 \text{ min}$$

$$\text{Total } T_c = 37 + 5.7 \quad \underline{\underline{42.7 \text{ min}}}$$

4. Kirby Methodoverland

$$T_c = 0.83 \left( \frac{N L}{\sqrt{S}} \right)^{0.467}$$

$$N = 0.6 \quad S = .17 \quad L = 2200$$

$$T_c = 0.83 \left[ \frac{(0.6)(2200)}{\sqrt{.17}} \right]^{0.467} = 36 \text{ min.}$$

JOB NO.

SQUARES  
1/4 IN. SCALE

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

for channel use Mannings, as method 3

$$V = 8.7 \text{ ft/sec} \quad T_c = \frac{3000 \text{ ft}}{8.7 \text{ ft/sec}} = 5.7 \text{ min.}$$

$$\text{Total } T_c = 36 + 5.7 = \underline{\underline{41.7 \text{ min.}}}$$

Average  $T_c$ 

$$\frac{20 + 49 + 42.7 + 41.7}{4} = 38.4 \text{ min}$$

$$T_L = 0.6 \times 38.4 = 23 \text{ min} = \boxed{.38 \text{ hrs}}$$

Anderson-Nichols & Company, Inc.

Subject Kanipe Lake Dam

Sheet No. 4 of 14  
 Date 4/6/81  
 Computed CRP  
 Checked KBS

JOB NO.

SQUARES  
1/4 IN. SCALE

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

# STAGE - STORAGE DETERMINATION

\* Average Depth of Lake is 6'

| Elevation<br>ft | Surface Area<br>Acres | Av S.A<br>Acres | Incremental<br>Storage | Cumulative<br>Storage |
|-----------------|-----------------------|-----------------|------------------------|-----------------------|
| 535             | 25.6                  | 25.6            | 153.6                  | 153.6                 |
| 540             | 44.8                  | 35.2            | 176.0                  | 329.6                 |
| 560             | 70.4                  | 57.6            | 1152.0                 | 1481.6                |

Input from HEC-I (from curve)

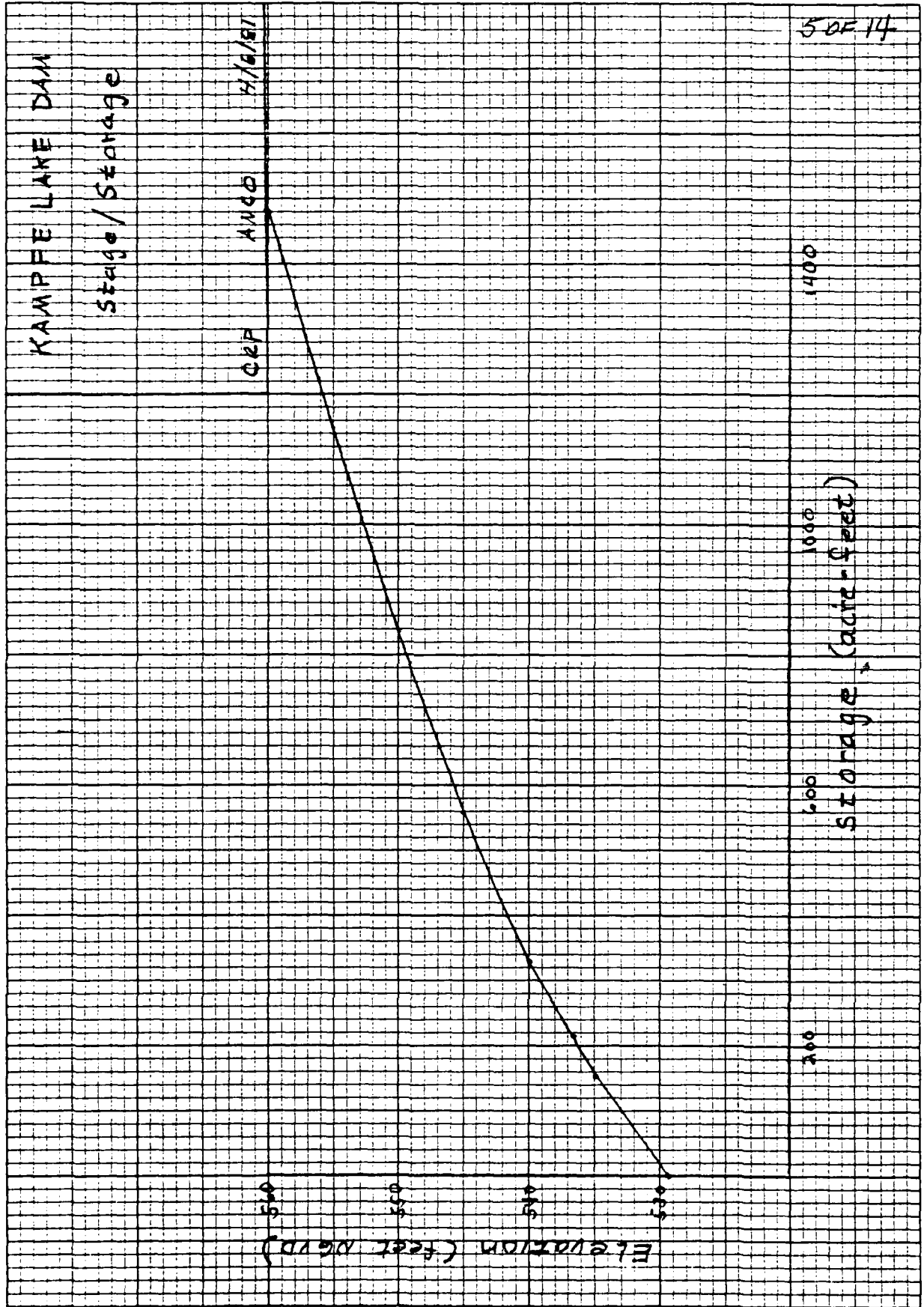
| Stage | Storage |
|-------|---------|
| 529.5 | 0       |
| 535   | 153.6   |
| 536.8 | 215.0   |
| 540   | 329.6   |
| 545   | 560.0   |
| 550   | 840.0   |
| 555   | 1150.0  |
| 560   | 1482.0  |

\* Dam repair application gives capacity at spillway of 52 million gallons; surface area = ~26 acres

$$3.259 \times 10^5 \times 1 \text{ gal} = 1 \text{ acre-ft}$$

$$\frac{52 \times 10^6}{3.259 \times 10^5} = 159.6 \text{ acre-ft}$$

$$\frac{159.6 \text{ acre-ft}}{26 \text{ acres}} = \sim 6'$$





JOB NO.

SQUARES  
1/4 IN. SCALE

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

1

2

DEVELOPMENT OF RATING CURVE

$$Q = CLH^{3/2}$$

3

4

① Spillway Curve

5

6

$$C = 2.68$$

$$L = 31'$$

$$\text{width} = 7'$$

7

8

9

10

11

12

13

14

15

Elevation

Spillway

Top of Dam

Combined

head

Q-cfs

head

length

cfs

Q-cfs

SPILLWAY

535.0

0

0

17

535.5

0.5

29.1

29.1

18

536.0

1.0

83.1

83.1

19

536.5

1.5

152.7

152.7

TOP DAM

536.8

1.8

200.7

0

100

0

200.7

21

537.0

2.0

235.0

0.2

100

23.6

258.6

22

537.5

2.5

328.5

0.7

130

201.0

529.5

23

538.0

3.0

431.8

1.2

160

555.3

987.1

24

538.5

3.5

544.1

1.7

185

1082.6

1626.7

25

539.0

4.0

664.8

2.2

220

1895.2

2560.0

26

540.0

5.0

929.1

3.2

270

4080.3

5009.4

27

542.0

7.0

1540.0

5.2

290

9078.3

10618.3

28

29

30

31

32

33

34

35

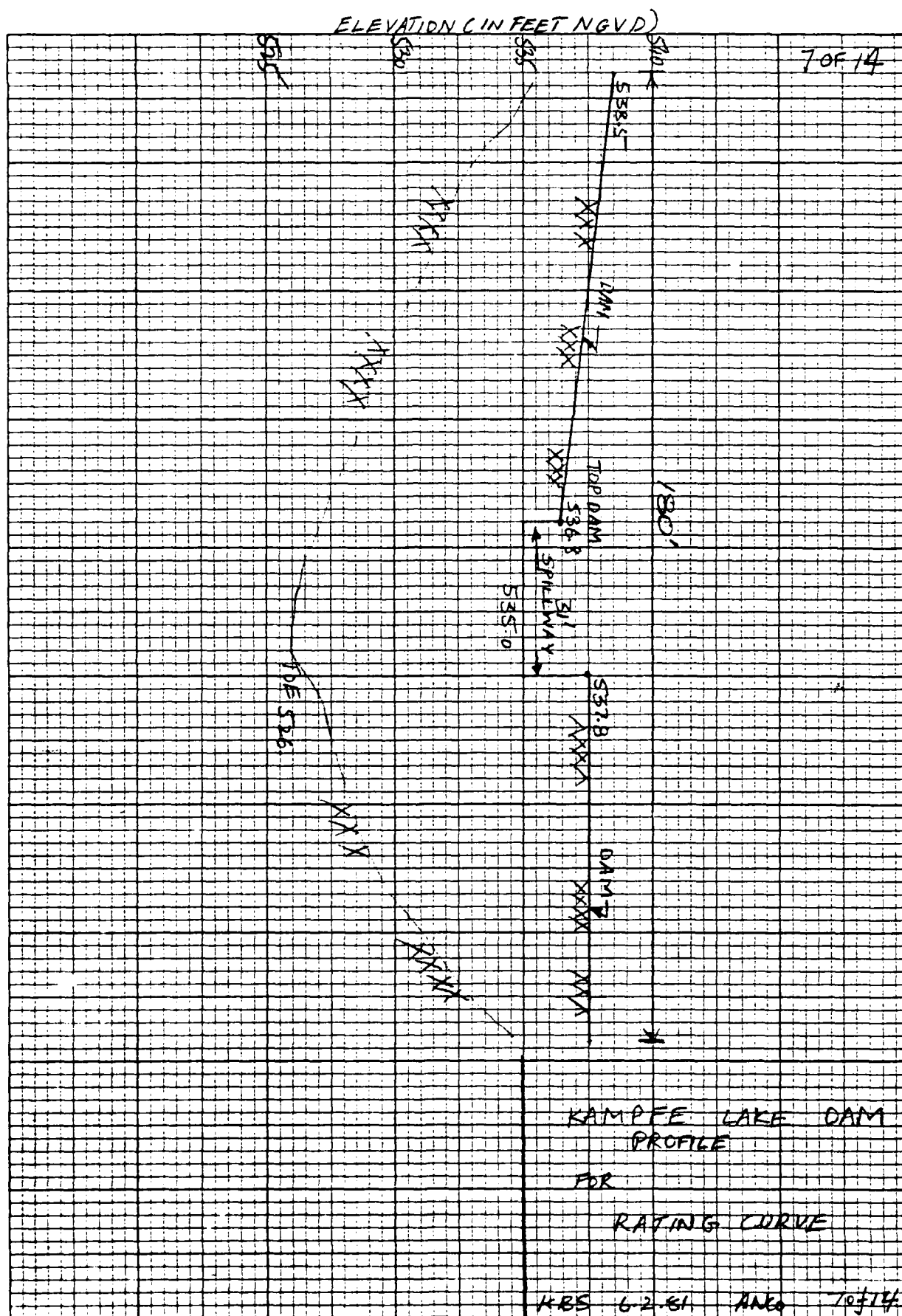
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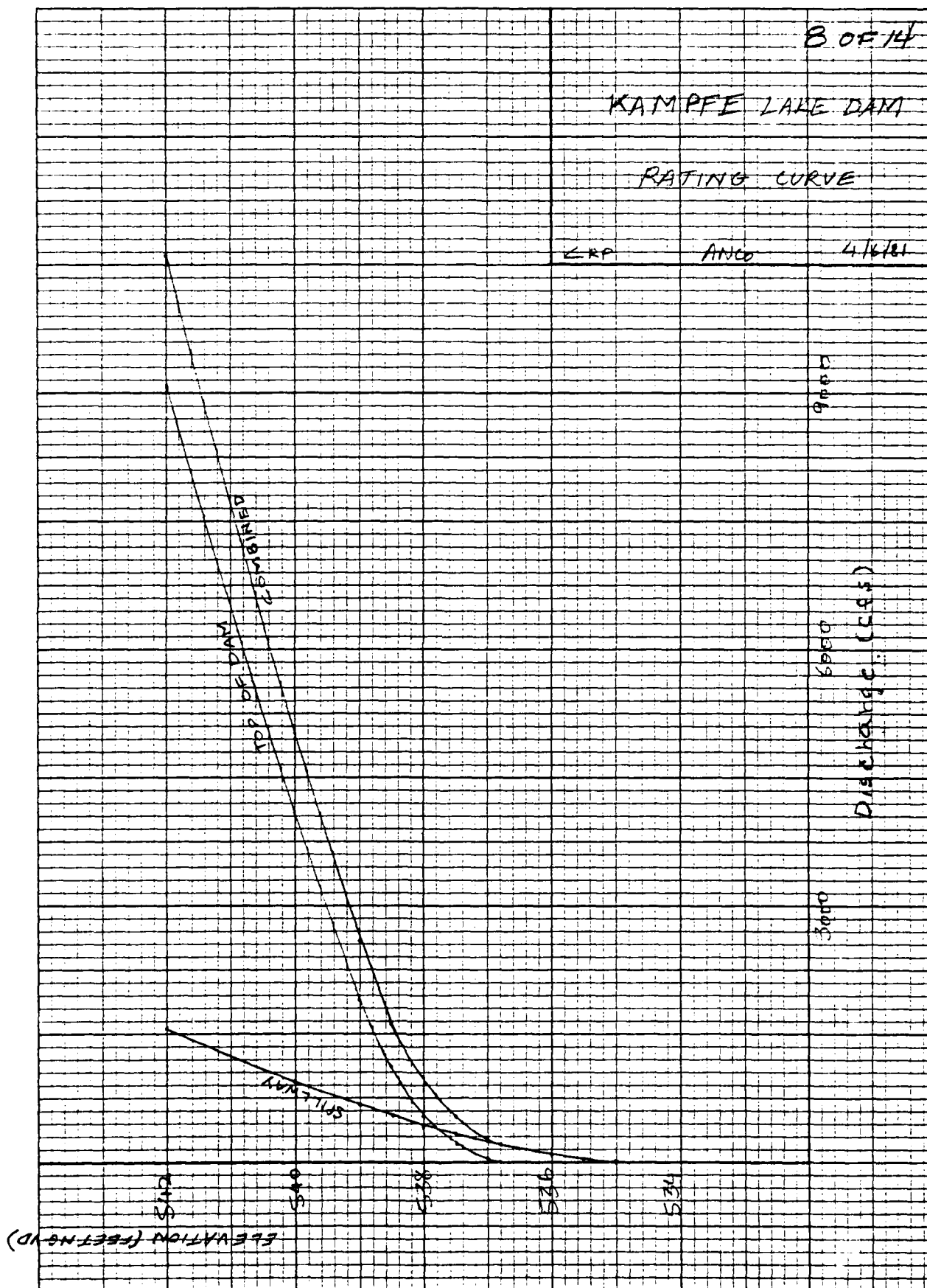
37

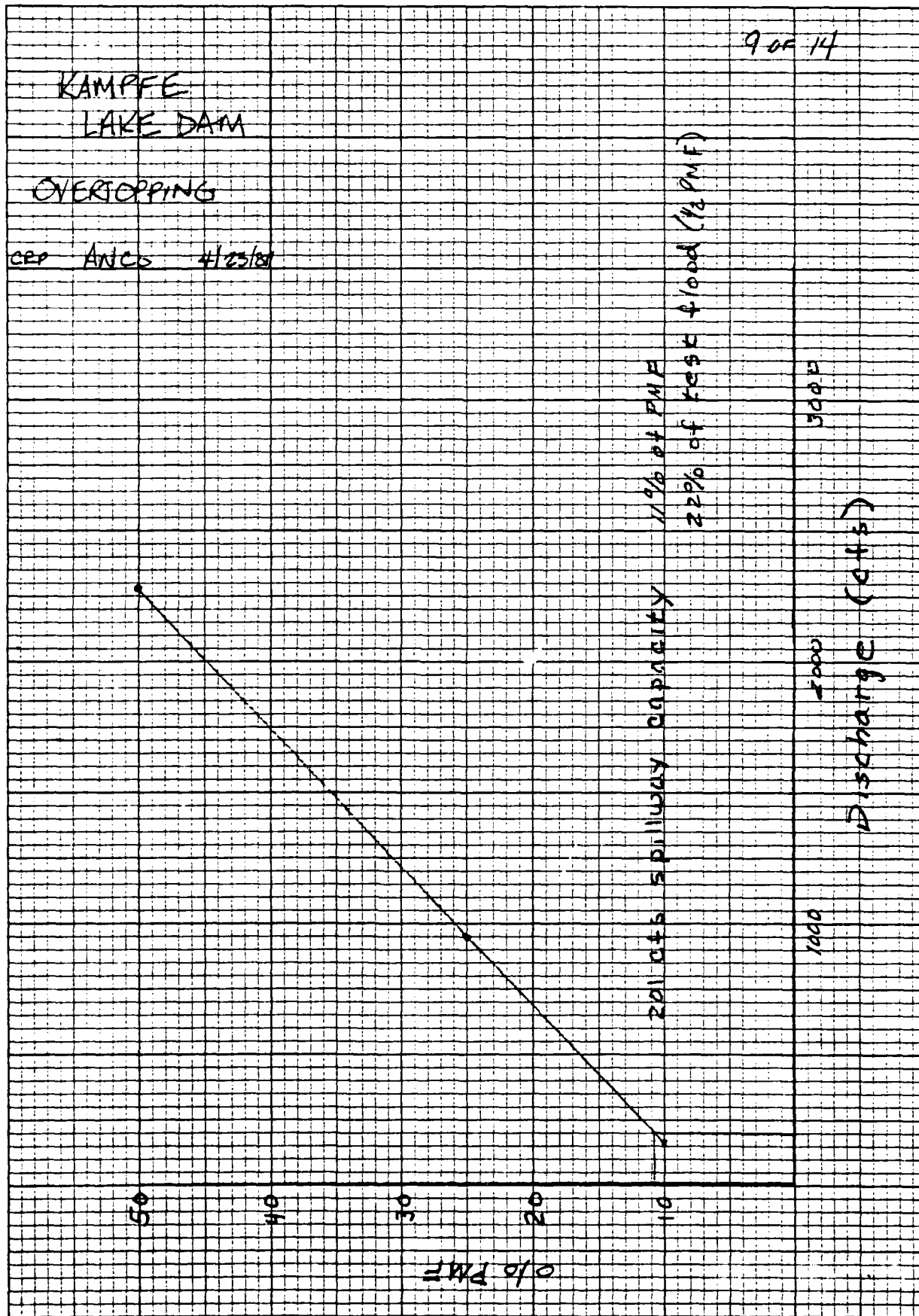
38

39

40







JOB NO.

HORIZONTAL SCALE  
1 IN. = 100 FEET

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

## Downstream Hazard

Star Lake Upper Dam (NJ00221) was designated as High Hazard in the Phase 1 Inspection Report of February 1980, because failure of this dam would overtop Star Lake Lower Dam.

Downstream of Star Lake Lower Dam is a camp ground with buildings that are inhabited on a seasonal basis, and therefore loss of more than a few lives is possible.

Failure of Kampfe Lake Dam just before overtopping (at 536.8 ft NGVD) resulted in a maximum outflow of 2886 cfs at Star Lake Upper Dam.

Because the storage behind Star Lake Lower Dam is minimal, this discharge (2886 cfs) was assumed to be about the same at the lower dam.

Referring to the stage/discharge calculations from the Star Lake Upper Phase 1 Report, this discharge would cause a stage about 2 feet above the crest of Star Lake Lower Dam and the discharge would exceed that caused by failure of Star Lake Upper Dam.

Therefore, Kampfe Lake Dam should also be designated as High Hazard.

JOB NO.

SQUARES  
1/4 IN. SCALE

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Determination of "C" for  
high level and low level outlets

Each 12-in  $\phi$  high level pipe:

$$D = \text{Diameter} = 12\text{-in}$$

$$n = .013 \text{ cast iron (King + Brater 6-15)}$$

$$A_p = \text{area of pipe opening} = 0.79 \text{ ft}^2$$

$$L_p = \text{length of pipe}$$

$$K_f = \text{friction loss through pipe}$$

$$K_f = \frac{5087 n^2}{D^{4/3}} = \frac{5087 (.013)^2}{12^{4/3}} = \frac{0.86}{27.5} = .031$$

$$K_L = \text{entrance loss to pipe} = 0.8 \text{ (K+B 6-19)}$$

$$C_p = A_p \sqrt{\frac{2g}{1 + K_L + K_f L_p}} = 0.79 \sqrt{\frac{64.4}{1 + 0.8 + .031(70)}} = 3.2$$

$$C = C_p / A_p / \sqrt{2g} = 0.5$$

16-in  $\phi$  low level pipe

$$D = 16 \text{ in } n = .013 \quad A_p = 1.40 \text{ ft}^2$$

$$L_p = 35$$

$$K_f = \frac{5087 (.013)^2}{(16)^{4/3}} = .021$$

$$K_L = 0.8$$

$$C_p = 1.4 \sqrt{\frac{2g}{1 + .8 + .021(35)}} = 7.1$$

$$C = 7.1 / 1.4 / \sqrt{2g} = 0.63$$

JOB NO.

SQUARES  
1/4 IN. SCALE

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Drainage Calculations for Two  
High Level outlets and One  
Low Level outlet

- Assume ① no significant outflow  
 ② Two 12-in  $\phi$  high level pipes  
 entrance inverts 532.7 + 532.9  
 take h above mid-pt.  
 $532.8 \text{ (ave)} + 6" = 533.3$   
 $C_p = 3.2$  for each  
 ③ one 16-in  $\phi$  low level pipe  
 entrance invert 528.0  
 take h above mid-pt.  
 $528 + 8" = 528.7 \quad C_p = 7.1$   
 ④  $Q_p = C_p H^{1/2}$   
 ⑤  $\text{Acft/day} = 1.9835 \times Q_{\text{ave}}$   
 ⑥  $\text{Days} = \Delta \text{ storage} / \text{Acft/day}$

| ELEV  | Storage<br>(Acft) | $\Delta$<br>S | H (ft) |     | Q   |      | Ave<br>Q | Acft/<br>day | days |
|-------|-------------------|---------------|--------|-----|-----|------|----------|--------------|------|
|       |                   |               | 12"    | 16" | 12" | 16"  |          |              |      |
| 535   | 154               |               | 1.7    | 6.3 | 8.3 | 17.8 |          |              |      |
|       |                   | 29            |        |     |     |      | 23.9     | 47.4         | 0.61 |
| 534   | 125               |               | 0.7    | 5.3 | 5.4 | 16.3 |          |              |      |
|       |                   | 25            |        |     |     |      | 18.5     | 36.7         | 0.68 |
| 533.3 | 100               |               | 0      | 4.6 | 0   | 15.2 |          |              |      |
|       |                   | 23            |        |     |     |      | 14.1     | 28.0         | 0.82 |
| 532   | 77                |               | 0      | 3.3 | 0   | 12.9 |          |              |      |
|       |                   | 40            |        |     |     |      | 10.5     | 20.8         | 1.92 |
| 530   | 37                |               | 0      | 1.3 | 0   | 8.1  |          |              |      |
|       |                   | 37            |        |     |     |      | 4.0      | 7.9          | 4.68 |
| 528.7 | 0                 |               | 0      | 0   | 0   | 0    |          |              |      |

8.7  
days

Anderson-Nichols & Company, Inc.

Subject STAR LAKE UPPER DAM

Sheet No. 12-4-77 of 1  
 Date 12-4-77  
 Computed END  
 Checked END

JOB NO. 3409-09

22-E

QUARCS 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29  
 4 IN SCALE

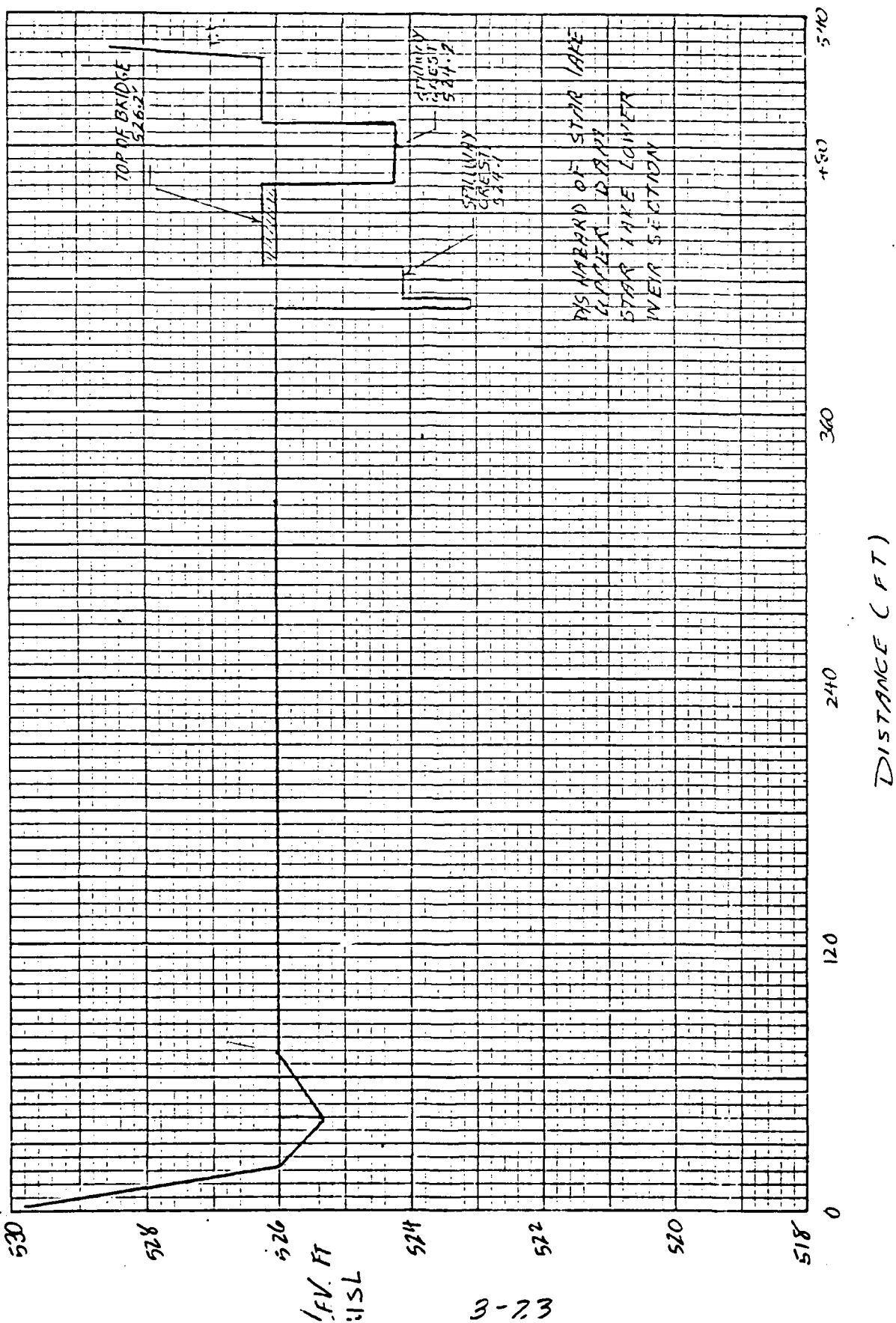
"KATING CURVE FOR 100% DISCHARGE"

| ELEV.<br>(FT) | LEFT SPILLWAY<br>HEAD<br>$L = 20$ FT<br>(FT) | RIGHT SPILLWAY<br>HEAD<br>$L = 26$ FT<br>(FT) | TOP OF DAM<br>HEAD<br>(FT) | LENGTH<br>(FT) | Q<br>(CFS) | COMBINED<br>Q<br>(CFS) |
|---------------|--|---|----------------------------|----------------|------------|------------------------|
| 524.1         | 0  | 0   | 0                          |                |            | 0                      |
| 524.2         | 0.1  | 0   | 0                          |                |            | 2                      |
| 525.3         | 1.2  | 1.1   | 0                          |                | 0          | 163                    |
| 526           | 1.9  | 1.8   | 0.7                        | 50             | 27         | 384                    |
| 526.2         | 2.1  | 2   | 0.7                        | 450            | 104        | 440                    |
| 527           | 2.9  | 2.8   | 0.8                        | 450            | 165        | 475                    |
| 527.5         | 3.4  | 3.3   | 0.5                        | 450            | 170        | 1677                   |
|               |  |   |                            |                | 1562       | 2070                   |
|               |  |   |                            |                | 2149       | 2795                   |

a) UP TO THE LOW CHORD OF THE BRIDGE USE WEIR EQUATION ( $C = 2.9$ )  
 b) FROM LOW CHORD UP USE WEIR EQUATION WITH ( $C = 2.3$ ) TO ACCOUNT  
 FOR LOSSES DUE TO THE BRIDGE  
 c)  $C = 2.6$  FOR DIRT ROAD  
 \* "C" VALUES WERE TAKEN FROM BRATER & KING "HANDBOOK OF HYDRAULICS"

130514





APPENDIX 5

HEC-1 OUTPUT

KAMPFE LAKE DAM

10.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

IO KAMPFE LAKL UCM UNVSTOPEING ANALYSIS 22KPSOMERVILLE A-NECO INC#2  
 IO HFC JUKSY DAE NO: 772 PASSATE CUMITY FURUGH OF BLOOMINGDALE  
 IO 0.1 0.25 0.5 MULTIPLES OF PPF FROM 24-HOUR PMP  
 IO 5 1 0 300

JR FLOW 1 0 0.1 0.25 0.5

KK A1 KAMPFE LAKE COMPUTATION-EXPONENTIAL LOSS RATE  
 KM SCS UNIT GRZPH

RA 0.05 2.5 1 NO 113 123 132  
 PH 22.1 1 5  
 LU .38

KK A2 KOUTE IN-FLOW HYDROGRAPH THROUGH KAMPFE LAKE

ES STUR 154 260 330 420 515  
 SV 154 215 335 540 544  
 SE 526.5 535 536.8 5009 540  
 SS 535 536 538 539  
 SZ 536.8 2.64 1.5 1.5

LINE 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

\*\*\*\*\*  
 100 (-1)  
 TIME 15.33.50  
 \*\*\*\*\*

\*\*\*\*\*  
 U.S. ARMY CORPS OF ENGINEERS  
 THE HYDROLOGIC ENGINEERING CENTER  
 609 SECOND STREET  
 DAVIS, CALIFORNIA 95616  
 (916) 440-3215 (R) (FIS) 448-3275  
 \*\*\*\*\*

KAMPFE LAKE DAM OVERTOPPING ANALYSIS #K850MERMVILL A-N&CO INC#9  
 NEW JERSEY DAM NO. 772 PASSAIC COUNTY BOROUGH OF BLOOMINGDALE  
 0.1-0.25-0.5 MULTIPLS OF PMF FROM 24-HOUR PMF

OUTPUT CONTROL VARIABLES  
 PRINT CONTROL  
 PLOT CONTROL  
 HYDROGRAPH PLOT SCALE  
 PRINT DIAGNOSTIC MESSAGES

HYDROGRAPH TIME DATA 5 MINUTES IN COMPUTATION INTERVAL  
 STARTING DATE  
 STARTING TIME  
 NUMBER OF HYDROGRAPH ORDINATES  
 ENDING DATE  
 ENDING TIME  
 COMPUTATION INTERVAL 0.08 HOURS  
 TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS  
 DRAINAGE AREA SQUARE MILES  
 PRECIPITATION DEPTH INCHES  
 LENGTH, ELEVATION FEET  
 FLOW CUBIC FEET PER SECOND  
 STORAGE VOLUME ACRES-Feet  
 SURFACE AREA ACRES  
 TEMPERATURE DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION 1 NUMBER OF PLANS  
 JR MULTI-RATIO OPTION  
 RATIOS OF RUNOFF 0.25 0.50

\*\*\*\*\*  
 KAMPFE LAKE  
 \*\*\*\*\*

SCS UNIT GRAPH COMPUTATION-EXPONENTIAL LOSS RATE

SUBBASIN RUNOFF DATA

10 BA SUBBASIN CHARACTERISTICS  
 AREA 0.85 SUBBASIN AREA

11 BF BASE FLOW CHARACTERISTICS  
 STRTC 2.50 INITIAL FLOW  
 WKCSN 2.50 BEGIN BASE FLOW REVERSION  
 KTIDR 1.0000 REVERSION CONSTANT

\*\*\* \*\* \*\* \*\* \*\*

# PRECIPITATION DATA

12 PM PROBABLE MAXIMUM SIGHT INDEX PRECIPITATION, TRANSPOSITION COEFFICIENT TRANSPOSITION AREA USE SMD DISTRIBUTION

PERCENT OF INDEX PRECIPITATION OCCURRING IN GIVEN TIME

13 LU UNIFORM LOSS RATE INITIAL LOSS RATE

14 US SCS DIMENSIONLESS UNITGRAPH LAG

\*\*\*

UNIT HYDROGRAPH 25 ENC-OF-PERIOD COORDINATES

\*\*\*\*\*

## HYDROGRAPH AT STATION A1

\*\*\*\*\*

| CA HF | MAH | ORD  | RAIN | LOSS | EXCESS | COMP Q | DA | MON  | HE-M | ORD  | RAIN | LOSS | EXCESS | COMP |
|-------|-----|------|------|------|--------|--------|----|------|------|------|------|------|--------|------|
| 0000  | 1   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1230 | 151  | 0.17 | 0.01 | 0.16 | 649.   |      |
| 0005  | 2   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1235 | 152  | 0.17 | 0.01 | 0.16 | 758.   |      |
| 0010  | 3   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1240 | 153  | 0.17 | 0.01 | 0.16 | 839.   |      |
| 0015  | 4   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1245 | 154  | 0.17 | 0.01 | 0.16 | 894.   |      |
| 0020  | 5   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1250 | 155  | 0.17 | 0.01 | 0.16 | 935.   |      |
| 0025  | 6   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1255 | 156  | 0.17 | 0.01 | 0.16 | 964.   |      |
| 0030  | 7   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1300 | 157  | 0.17 | 0.01 | 0.16 | 986.   |      |
| 0035  | 8   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1305 | 158  | 0.20 | 0.01 | 0.19 | 1005.  |      |
| 0040  | 9   | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1310 | 159  | 0.20 | 0.01 | 0.19 | 1026.  |      |
| 0045  | 10  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1315 | 160  | 0.20 | 0.01 | 0.19 | 1050.  |      |
| 0050  | 11  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1320 | 161  | 0.20 | 0.01 | 0.19 | 1065.  |      |
| 0055  | 12  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1325 | 162  | 0.20 | 0.01 | 0.19 | 1080.  |      |
| 0100  | 13  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1330 | 163  | 0.20 | 0.01 | 0.19 | 1120.  |      |
| 0105  | 14  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1335 | 164  | 0.20 | 0.01 | 0.19 | 1180.  |      |
| 0110  | 15  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1340 | 165  | 0.20 | 0.01 | 0.19 | 1200.  |      |
| 0115  | 16  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1345 | 166  | 0.20 | 0.01 | 0.19 | 1220.  |      |
| 0120  | 17  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1350 | 167  | 0.20 | 0.01 | 0.19 | 1230.  |      |
| 0125  | 18  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1355 | 168  | 0.20 | 0.01 | 0.19 | 1240.  |      |
| 0130  | 19  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1400 | 169  | 0.20 | 0.01 | 0.19 | 1246.  |      |
| 0135  | 20  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1405 | 170  | 0.20 | 0.01 | 0.19 | 1255.  |      |
| 0140  | 21  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1410 | 171  | 0.20 | 0.01 | 0.19 | 1272.  |      |
| 0145  | 22  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1415 | 172  | 0.20 | 0.01 | 0.19 | 1300.  |      |
| 0150  | 23  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1420 | 173  | 0.20 | 0.01 | 0.19 | 1350.  |      |
| 0155  | 24  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1425 | 174  | 0.20 | 0.01 | 0.19 | 1401.  |      |
| 0200  | 25  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1430 | 175  | 0.20 | 0.01 | 0.19 | 1446.  |      |
| 0205  | 26  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1435 | 176  | 0.20 | 0.01 | 0.19 | 1475.  |      |
| 0210  | 27  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1440 | 177  | 0.20 | 0.01 | 0.19 | 1500.  |      |
| 0215  | 28  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1445 | 178  | 0.20 | 0.01 | 0.19 | 1515.  |      |
| 0220  | 29  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1450 | 179  | 0.20 | 0.01 | 0.19 | 1530.  |      |
| 0225  | 30  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1455 | 180  | 0.20 | 0.01 | 0.19 | 1560.  |      |
| 0230  | 31  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1500 | 181  | 0.20 | 0.01 | 0.19 | 1567.  |      |
| 0235  | 32  | 0.01 | 0.00 | 0.00 | 0.00   | 3.0    | 1  | 1505 | 182  | 0.20 | 0.01 | 0.19 | 1571.  |      |

[illegible]







|           |       |
|-----------|-------|
| PEAK FLOW | TIME  |
| (CFS)     | (HR)  |
| 2717.     | 15.92 |

(CFS)  
(INCHES)  
(AC-F)

|                 |        |       |
|-----------------|--------|-------|
| MAXIMUM AVERAGE | 72     | 221.  |
| 24-HR           | 238.   | 10:39 |
|                 | 10:395 | 471.  |
|                 | 471.   |       |

CUMULATIVE AREA = 0.85 SG MI

## ROUTE INFLOW HYDROGRAPH THROUGH KAMPEE LAKE.

## HYDROGRAPH ROUTING DATA

[illegible]

| STORAGE                        | 154.00 | 187.69 | 215.00 | 260.00 | 295.00 | 330.00 |
|--------------------------------|--------|--------|--------|--------|--------|--------|
| COMPUTED STORAGE-DUTFLOW CURVE |        |        |        |        |        |        |

HYDROGRAPH AT STATION =  
PLAN 1. 0.50 A2

| A | MGN  | HRMN | ORD | OUTFLOW | STORAGE | STAGE | DA | MGN  | HRMN | ORD | OUTFLOW | STORAGE | STAGE |
|---|------|------|-----|---------|---------|-------|----|------|------|-----|---------|---------|-------|
| 1 | 0000 | 1    | 2   | 0.      | 154.0   | 535.0 | 1  | 0020 | 101  | 201 | 124.    | 254.7   | 537.9 |
| 1 | 0005 | 2    | 3   | 0.      | 154.0   | 535.0 | 1  | 0025 | 102  | 202 | 123.    | 254.2   | 537.7 |
| 1 | 0010 | 3    | 4   | 0.      | 154.0   | 535.0 | 1  | 0030 | 103  | 203 | 119.    | 249.7   | 537.7 |
| 1 | 0015 | 4    | 5   | 0.      | 154.0   | 535.0 | 1  | 0035 | 104  | 204 | 109.    | 247.0   | 537.7 |
| 1 | 0020 | 5    | 6   | 0.      | 154.0   | 535.0 | 1  | 0040 | 105  | 205 | 104.    | 246.4   | 537.6 |
| 1 | 0025 | 6    | 7   | 0.      | 154.0   | 535.0 | 1  | 0045 | 106  | 206 | 97.     | 243.5   | 537.5 |
| 1 | 0030 | 7    | 8   | 0.      | 154.1   | 535.0 | 1  | 0050 | 107  | 207 | 94.     | 243.0   | 537.5 |
| 1 | 0035 | 8    | 9   | 0.      | 154.1   | 535.0 | 1  | 0055 | 108  | 208 | 87.     | 241.6   | 537.5 |
| 1 | 0040 | 9    | 10  | 0.      | 154.1   | 535.0 | 1  | 0060 | 109  | 209 | 83.     | 239.5   | 537.5 |
| 1 | 0045 | 10   | 11  | 0.      | 154.1   | 535.0 | 1  | 0065 | 110  | 210 | 81.     | 238.5   | 537.4 |
| 1 | 0050 | 11   |     | 0.      | 154.1   | 535.0 | 1  | 0070 | 111  | 211 | 80.     | 238.5   | 537.4 |

[illegible]



PEAK FLOW AND STAGE (UND-OF-PLURIED) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS  
 FLOWS IN CULIC FEET PER SECOND; AREA IN SQUARE FEET  
 TIME TO PEAK IN HOURS

| OPERATION                 | STATION | AREA | PLAN | RATIOS APPLIED TO FLOWS |         |         |
|---------------------------|---------|------|------|-------------------------|---------|---------|
|                           |         |      |      | RATIO 1                 | RATIO 2 | RATIO 3 |
| HYDROGRAPH AT             | A1      | 0.85 | 1    | 0.10                    | 0.25    | 0.50    |
|                           |         |      |      | 543                     | 1358    | 2717    |
| ROUTED TO                 | A2      | 0.85 | 1    | 15.92                   | 15.92   | 15.92   |
|                           |         |      |      | 155                     | 949     | 2279    |
|                           |         |      |      | 17.08                   | 16.17   | 16.08   |
| ** PEAK STAGES IN FEET ** |         |      |      |                         |         |         |
|                           |         |      | 1    | 536.45                  | 537.55  | 538.34  |
|                           |         |      |      | 17.08                   | 16.17   | 16.08   |

# SUMMARY OF DAM OVERTOPPING/SPILLAGE ANALYSIS FOR STATION A2

| PLAN 1 .....       | ELEVATION<br>STORAGE<br>OUTFLOW   | INITIAL VALUE               | SPILLWAY CREST            | TOP OF DAM | DURATION<br>OVER TOP<br>HOURS | TIME OF<br>MAX. OUTFLOW<br>HOURS | TIME OF<br>FAILURE<br>HOURS |
|--------------------|-----------------------------------|-----------------------------|---------------------------|------------|-------------------------------|----------------------------------|-----------------------------|
|                    |                                   | 535.00                      | 535.00                    | 535.00     |                               |                                  |                             |
|                    |                                   | 154.                        | 154.                      | 215.       |                               |                                  |                             |
|                    |                                   | 0.                          | 0.                        | 201.       |                               |                                  |                             |
| RATIO<br>OF<br>PHE | MAXIMUM<br>RESERVOIR<br>W.S. ELEV | MAXIMUM<br>STORAGE<br>AC-FT | MAXIMUM<br>OUTFLOW<br>CFS |            |                               |                                  |                             |
| 0.10               | 536.49                            | 204.                        | 155.                      | 0.0        | 17.06                         | 0.0                              | 0.0                         |
| 0.25               | 537.55                            | 243.                        | 249.                      | 3.42       | 16.17                         | 0.0                              | 0.0                         |
| 0.50               | 538.34                            | 272.                        | 279.                      | 5.42       | 16.06                         | 0.0                              | 0.0                         |

\*\*\*NORMAL-END-OF-JOB\*\*\*

INC-1 1.0.01

10.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

10 KAMPEL LAKE DEM BREACH ANALYSIS #KANSASVILLE A-RICH INC##  
 NEW JERSEY DAN NO. 772 PASSAIC COUNTY TOWN OF BLOOMINGDALE

10 5 2 0 1 0 200 200 200 200 300 300

KK 01 A1 KAMPEL LAKE 200 200 200 200 300 300

KK 02 A2 ROUTE 2 INFLW HYDROGRAPH THROUGH KAMPEL LAKE

KK 03 S10K 154 330 420 515  
 KK 04 S10K 154 330 420 515  
 KK 05 S10K 154 330 420 515  
 KK 06 S10K 154 330 420 515  
 KK 07 S10K 154 330 420 515  
 KK 08 S10K 154 330 420 515  
 KK 09 S10K 154 330 420 515  
 KK 10 S10K 154 330 420 515

KK 11 A5 ROUTE 2 BREACHED OUTFLW THROUGH STAR LAKE

KK 12 RS 1 150 165 172 197  
 KK 13 SV 0 150 165 172 197  
 KK 14 SE 0 150 165 172 197  
 KK 15 SS 0 150 165 172 197  
 KK 16 ST 0 150 165 172 197

LINE

1

2

3

4

5

6

7

8

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22

23

24

25

```

*****
FLOOD HYDROGRAPH PACKAGE (HLC-1)
FLUKUARY 1981
*****
RUN DATE 07/22/81 TIME 10.17.24
*****

```

```

*****
U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
609 S. CEDAR STREET
SAVING, CALIFORNIA 95616
(916) 440-3285 (K (FIS) 448-3285
*****

```

```

KAMPF LAKE DAM PREACH ANALYSIS BUREAU OF BLOOMINGDALE
NEW JERSEY DAM NO. 772 PASSAIC COUNTY

```

```

4 10 OUTPUT CONTROL VARIABLES
PRINT CONTROL
PLOT CONTROL
HYDROGRAPH PLOT SCALE
YES PRINT DIAGNOSTIC MESSAGES

```

```

HYDROGRAPH TIME DATA 5 MINUTES IN COMPUTATION INTERVAL
STARTING DATE
STARTING TIME
NUMBER OF HYDROGRAPH ORDINATES
ENDING DATE
ENDING TIME
COMPUTATION INTERVAL 0.08 HOURS
TOTAL TIME BASE 16.58 HOURS

```

```

ENGLISH UNITS
PRECIPITATION AREA SQUARE MILES
PRECIPITATION DEPTH INCHES
FLOW LENGTH ELEVATION FEET
FLOW STORAGE VOLUME CUBIC FEET PER SECOND
SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

```

```

*****
5 KK *****
*****

```

```

*****
A1
*****
KAMPF LAKE

```

```

SUBBASIN RUNCFF DATA
SUBBASIN CHARACTERISTICS
SUBBASIN AREA
0.0

```

```

*****
HYDROGRAPH AT STATION A1
*****

```

```

*****

```

| DA | MDN  | HR   | ORD | FLOW | CA | MDN  | HR   | ORD | FLOW | CA | MDN  | HR   | ORD | FLOW | DA | MDN | HR  | ORD | FLOW |
|----|------|------|-----|------|----|------|------|-----|------|----|------|------|-----|------|----|-----|-----|-----|------|
| 1  | 0005 | 0005 | 1   | 300. | 1  | 0410 | 0410 | 1   | 300. | 1  | 0820 | 0820 | 1   | 300. | 1  | 130 | 130 | 1   | 300. |
| 1  | 0010 | 0010 | 2   | 300. | 1  | 0415 | 0415 | 2   | 300. | 1  | 0830 | 0830 | 2   | 300. | 1  | 135 | 135 | 2   | 300. |
| 1  | 0015 | 0015 | 3   | 300. | 1  | 0420 | 0420 | 3   | 300. | 1  | 0835 | 0835 | 3   | 300. | 1  | 140 | 140 | 3   | 300. |
| 1  | 0020 | 0020 | 4   | 300. | 1  | 0425 | 0425 | 4   | 300. | 1  | 0840 | 0840 | 4   | 300. | 1  | 145 | 145 | 4   | 300. |
| 1  | 0025 | 0025 | 5   | 300. | 1  | 0430 | 0430 | 5   | 300. | 1  | 0845 | 0845 | 5   | 300. | 1  | 150 | 150 | 5   | 300. |
| 1  | 0030 | 0030 | 6   | 300. | 1  | 0435 | 0435 | 6   | 300. | 1  | 0850 | 0850 | 6   | 300. | 1  | 155 | 155 | 6   | 300. |
| 1  | 0035 | 0035 | 7   | 300. | 1  | 0440 | 0440 | 7   | 300. | 1  | 0855 | 0855 | 7   | 300. | 1  | 160 | 160 | 7   | 300. |
| 1  | 0040 | 0040 | 8   | 300. | 1  | 0445 | 0445 | 8   | 300. | 1  | 0900 | 0900 | 8   | 300. | 1  | 165 | 165 | 8   | 300. |
| 1  | 0045 | 0045 | 9   | 300. | 1  | 0450 | 0450 | 9   | 300. | 1  | 0905 | 0905 | 9   | 300. | 1  | 170 | 170 | 9   | 300. |
| 1  | 0050 | 0050 | 10  | 300. | 1  | 0455 | 0455 | 10  | 300. | 1  | 0910 | 0910 | 10  | 300. | 1  | 175 | 175 | 10  | 300. |
| 1  | 0055 | 0055 | 11  | 300. | 1  | 0500 | 0500 | 11  | 300. | 1  | 0915 | 0915 | 11  | 300. | 1  | 180 | 180 | 11  | 300. |
| 1  | 0100 | 0100 | 12  | 300. | 1  | 0505 | 0505 | 12  | 300. | 1  | 0920 | 0920 | 12  | 300. | 1  | 185 | 185 | 12  | 300. |
| 1  | 0105 | 0105 | 13  | 300. | 1  | 0510 | 0510 | 13  | 300. | 1  | 0925 | 0925 | 13  | 300. | 1  | 190 | 190 | 13  | 300. |
| 1  | 0110 | 0110 | 14  | 300. | 1  | 0515 | 0515 | 14  | 300. | 1  | 0930 | 0930 | 14  | 300. | 1  | 195 | 195 | 14  | 300. |
| 1  | 0115 | 0115 | 15  | 300. | 1  | 0520 | 0520 | 15  | 300. | 1  | 0935 | 0935 | 15  | 300. | 1  | 200 | 200 | 15  | 300. |
| 1  | 0120 | 0120 | 16  | 300. | 1  | 0525 | 0525 | 16  | 300. | 1  | 0940 | 0940 | 16  | 300. | 1  | 205 | 205 | 16  | 300. |
| 1  | 0125 | 0125 | 17  | 300. | 1  | 0530 | 0530 | 17  | 300. | 1  | 0945 | 0945 | 17  | 300. | 1  | 210 | 210 | 17  | 300. |
| 1  | 0130 | 0130 | 18  | 300. | 1  | 0535 | 0535 | 18  | 300. | 1  | 0950 | 0950 | 18  | 300. | 1  | 215 | 215 | 18  | 300. |
| 1  | 0135 | 0135 | 19  | 300. | 1  | 0540 | 0540 | 19  | 300. | 1  | 0955 | 0955 | 19  | 300. | 1  | 220 | 220 | 19  | 300. |
| 1  | 0140 | 0140 | 20  | 300. | 1  | 0545 | 0545 | 20  | 300. | 1  | 1000 | 1000 | 20  | 300. | 1  | 225 | 225 | 20  | 300. |
| 1  | 0145 | 0145 | 21  | 300. | 1  | 0550 | 0550 | 21  | 300. | 1  | 1005 | 1005 | 21  | 300. | 1  | 230 | 230 | 21  | 300. |
| 1  | 0150 | 0150 | 22  | 300. | 1  | 0555 | 0555 | 22  | 300. | 1  | 1010 | 1010 | 22  | 300. | 1  | 235 | 235 | 22  | 300. |
| 1  | 0155 | 0155 | 23  | 300. | 1  | 0600 | 0600 | 23  | 300. | 1  | 1015 | 1015 | 23  | 300. | 1  | 240 | 240 | 23  | 300. |
| 1  | 0200 | 0200 | 24  | 300. | 1  | 0605 | 0605 | 24  | 300. | 1  | 1020 | 1020 | 24  | 300. | 1  | 245 | 245 | 24  | 300. |
| 1  | 0205 | 0205 | 25  | 300. | 1  | 0610 | 0610 | 25  | 300. | 1  | 1025 | 1025 | 25  | 300. | 1  | 250 | 250 | 25  | 300. |
| 1  | 0210 | 0210 | 26  | 300. | 1  | 0615 | 0615 | 26  | 300. | 1  | 1030 | 1030 | 26  | 300. | 1  | 255 | 255 | 26  | 300. |
| 1  | 0215 | 0215 | 27  | 300. | 1  | 0620 | 0620 | 27  | 300. | 1  | 1035 | 1035 | 27  | 300. | 1  | 260 | 260 | 27  | 300. |
| 1  | 0220 | 0220 | 28  | 300. | 1  | 0625 | 0625 | 28  | 300. | 1  | 1040 | 1040 | 28  | 300. | 1  | 265 | 265 | 28  | 300. |
| 1  | 0225 | 0225 | 29  | 300. | 1  | 0630 | 0630 | 29  | 300. | 1  | 1045 | 1045 | 29  | 300. | 1  | 270 | 270 | 29  | 300. |
| 1  | 0230 | 0230 | 30  | 300. | 1  | 0635 | 0635 | 30  | 300. | 1  | 1050 | 1050 | 30  | 300. | 1  | 275 | 275 | 30  | 300. |
| 1  | 0235 | 0235 | 31  | 300. | 1  | 0640 | 0640 | 31  | 300. | 1  | 1055 | 1055 | 31  | 300. | 1  | 280 | 280 | 31  | 300. |
| 1  | 0240 | 0240 | 32  | 300. | 1  | 0645 | 0645 | 32  | 300. | 1  | 1100 | 1100 | 32  | 300. | 1  | 285 | 285 | 32  | 300. |
| 1  | 0245 | 0245 | 33  | 300. | 1  | 0650 | 0650 | 33  | 300. | 1  | 1105 | 1105 | 33  | 300. | 1  | 290 | 290 | 33  | 300. |
| 1  | 0250 | 0250 | 34  | 300. | 1  | 0655 | 0655 | 34  | 300. | 1  | 1110 | 1110 | 34  | 300. | 1  | 295 | 295 | 34  | 300. |
| 1  | 0255 | 0255 | 35  | 300. | 1  | 0700 | 0700 | 35  | 300. | 1  | 1115 | 1115 | 35  | 300. | 1  | 300 | 300 | 35  | 300. |
| 1  | 0300 | 0300 | 36  | 300. | 1  | 0705 | 0705 | 36  | 300. | 1  | 1120 | 1120 | 36  | 300. | 1  | 305 | 305 | 36  | 300. |
| 1  | 0305 | 0305 | 37  | 300. | 1  | 0710 | 0710 | 37  | 300. | 1  | 1125 | 1125 | 37  | 300. | 1  | 310 | 310 | 37  | 300. |
| 1  | 0310 | 0310 | 38  | 300. | 1  | 0715 | 0715 | 38  | 300. | 1  | 1130 | 1130 | 38  | 300. | 1  | 315 | 315 | 38  | 300. |
| 1  | 0315 | 0315 | 39  | 300. | 1  | 0720 | 0720 | 39  | 300. | 1  | 1135 | 1135 | 39  | 300. | 1  | 320 | 320 | 39  | 300. |
| 1  | 0320 | 0320 | 40  | 300. | 1  | 0725 | 0725 | 40  | 300. | 1  | 1140 | 1140 | 40  | 300. | 1  | 325 | 325 | 40  | 300. |
| 1  | 0325 | 0325 | 41  | 300. | 1  | 0730 | 0730 | 41  | 300. | 1  | 1145 | 1145 | 41  | 300. | 1  | 330 | 330 | 41  | 300. |
| 1  | 0330 | 0330 | 42  | 300. | 1  | 0735 | 0735 | 42  | 300. | 1  | 1150 | 1150 | 42  | 300. | 1  | 335 | 335 | 42  | 300. |
| 1  | 0335 | 0335 | 43  | 300. | 1  | 0740 | 0740 | 43  | 300. | 1  | 1155 | 1155 | 43  | 300. | 1  | 340 | 340 | 43  | 300. |
| 1  | 0340 | 0340 | 44  | 300. | 1  | 0745 | 0745 | 44  | 300. | 1  | 1200 | 1200 | 44  | 300. | 1  | 345 | 345 | 44  | 300. |
| 1  | 0345 | 0345 | 45  | 300. | 1  | 0750 | 0750 | 45  | 300. | 1  | 1205 | 1205 | 45  | 300. | 1  | 350 | 350 | 45  | 300. |
| 1  | 0350 | 0350 | 46  | 300. | 1  | 0755 | 0755 | 46  | 300. | 1  | 1210 | 1210 | 46  | 300. | 1  | 355 | 355 | 46  | 300. |
| 1  | 0355 | 0355 | 47  | 300. | 1  | 0800 | 0800 | 47  | 300. | 1  | 1215 | 1215 | 47  | 300. | 1  | 360 | 360 | 47  | 300. |
| 1  | 0400 | 0400 | 48  | 300. | 1  | 0805 | 0805 | 48  | 300. | 1  | 1220 | 1220 | 48  | 300. | 1  | 365 | 365 | 48  | 300. |
| 1  | 0405 | 0405 | 49  | 300. | 1  | 0810 | 0810 | 49  | 300. | 1  | 1225 | 1225 | 49  | 300. | 1  | 370 | 370 | 49  | 300. |
| 1  | 0410 | 0410 | 50  | 300. | 1  | 0815 | 0815 | 50  | 300. | 1  | 1230 | 1230 | 50  | 300. | 1  | 375 | 375 | 50  | 300. |

PEAK FLOW (CFS) 300.  
 TIME (HR) 0.33  
 (CFS) 300.  
 (INCHES) 0.000  
 (AC-FT) 149.  
 CUMULATIVE AREA = 0.0 SO MI  
 MAXIMUM AVERAGE FLOW 72-HR 298.  
 24-HR 298.  
 6-HR 300.  
 16.58-HR 298.  
 0.000  
 409.

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ROUTE INFLOW HYDROGRAPH THROUGH KAMPEE LAKE

8 KD  
 OUTPUT CONTROL VARIABLE  
 1. PRINT CONTROL  
 2. PLOT CONTROL  
 0. HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

| 9 RS  | STORAGE ROUTING                | 1. STOR | 2. TYPE OF INITIAL CONDITION | 3. NUMBER OF SURREACHES |
|-------|--------------------------------|---------|------------------------------|-------------------------|
|       | 1. STOR                        | 154.00  | 0.0                          | 0.0                     |
|       | 2. TYPE OF INITIAL CONDITION   | 0.0     | 154.0                        | 215.0                   |
|       | 3. WORKING R AND D COEFFICIENT | 535.00  | 536.80                       | 538.00                  |
| 10 SV | STORAGE                        | 0.0     | 154.0                        | 215.0                   |
| 11 SE | ELEVATION                      | 526.50  | 535.00                       | 536.80                  |
| 12 SQ | DISCHARGE                      | 0.0     | 83.0                         | 201.0                   |
| 13 SE | ELEVATION                      | 535.00  | 536.80                       | 538.00                  |
| 14 SS | SPILLWAY                       | 535.00  | 536.80                       | 538.00                  |

15 ST  
 TOP OF DAM  
 536.80  
 149.00  
 2.04  
 1.50  
 1.50

16 SB  
 BREACH DATA  
 526.50  
 55.00  
 1.00  
 1.00  
 536.80

COMPUTED STORAGE-OUTFLOW CURVE  
 STORAGE 154.00 107.39 215.00 260.00 295.00 330.00  
 OUTFLOW 0.0 33.00 201.00 987.00 2560.00 5009.00

BEGIN DAM FAILURE AT 3.92 HOURS

HYDROGRAPH AT STATION 42

| CA | MON  | HR | MIN | SEC | DA | HR | MIN | SEC | STAGE | STORAGE | OUTFLOW | ORD | STORAGE | OUTFLOW | ORD   | STAGE | STORAGE | OUTFLOW | ORD |
|----|------|----|-----|-----|----|----|-----|-----|-------|---------|---------|-----|---------|---------|-------|-------|---------|---------|-----|
| 1  | 0005 | 1  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 50.2    | 811.0   | 68  | 529.3   | 50.2    | 811.0 | 1115  | 300.0   | 135     | 52  |
| 2  | 0005 | 2  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 46.9    | 732.0   | 69  | 529.3   | 46.9    | 732.0 | 1115  | 300.0   | 136     | 52  |
| 3  | 0010 | 3  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 44.2    | 667.0   | 70  | 529.3   | 44.2    | 667.0 | 1115  | 300.0   | 137     | 52  |
| 4  | 0015 | 4  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 41.8    | 614.0   | 71  | 529.3   | 41.8    | 614.0 | 1115  | 300.0   | 138     | 52  |
| 5  | 0020 | 5  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 39.4    | 569.0   | 72  | 529.3   | 39.4    | 569.0 | 1115  | 300.0   | 139     | 52  |
| 6  | 0025 | 6  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 38.1    | 526.0   | 73  | 529.3   | 38.1    | 526.0 | 1115  | 300.0   | 140     | 52  |
| 7  | 0030 | 7  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 36.6    | 500.0   | 74  | 529.3   | 36.6    | 500.0 | 1115  | 300.0   | 141     | 52  |
| 8  | 0035 | 8  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 35.3    | 474.0   | 75  | 529.3   | 35.3    | 474.0 | 1115  | 300.0   | 142     | 52  |
| 9  | 0040 | 9  | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 34.2    | 461.0   | 76  | 529.3   | 34.2    | 461.0 | 1115  | 300.0   | 143     | 52  |
| 10 | 0045 | 10 | 00  | 00  | 1  | 00 | 00  | 00  | 529.3 | 33.2    | 431.0   | 77  | 529.3   | 33.2    | 431.0 | 1115  | 300.0   | 144     | 52  |

NEW JERSEY DEPT OF ENVIRONMENTAL PROTECTION TRENTON F/G 13/13  
NATIONAL DAM SAFETY PROGRAM, KAMPFE LAKE DAM (NJ00772), PASSAIC--ETC(U)  
JUL 81 W A GUINAN DACW61-79-C-0011

DAEN/NAP-53842/NJ00772-81/ NL

 $\Delta Q_{\text{max}}$ 

DATE

**FILMED**

33 34

DTIC



PEAK STORAGE  
(AC-F)  
216.

TIME  
(HR)  
4.08

PEAK STAGE  
(FEET)  
536.63

TIME  
(HR)  
4.08

6-HR  
107.

MAXIMUM AVERAGE  
24-HR  
77.

STORAGE  
72-HR  
78.

16.58-HR  
73.

6-HR  
534.55

MAXIMUM AVERAGE  
24-HR  
530.50

STAGE  
72-HR  
530.50

16.58-HR  
530.50

CUMULATIVE AREA = 0.0 SQ MI



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| PEAK FLOW IS                    | 2866. AT TIME                | 4.92 HOURS   |
|---------------------------------|------------------------------|--|
| PEAK FLOW<br>(CFS)<br>2086.     | TIME<br>(HR)<br>4.92         | 0-HR<br>661.<br>0.000<br>326.                          |
|                                 | (CFS)<br>(INCHES)<br>(AC-FT) | MAXIMUM AVERAGE FLOW<br>72-HR<br>385.<br>0.000<br>527. |
| RAIN STORAGE<br>(AC-FT)<br>182. | TIME<br>(HR)<br>4.92         | 0-HR<br>156.   |
|                                 |                              | MAXIMUM AVERAGE STORAGE<br>72-HR<br>146.               |
| PEAK STAGE<br>(FEET)<br>533.06  | TIME<br>(HR)<br>4.92         | 0-HR<br>531.82   |
|                                 |                              | MAXIMUM AVERAGE STAGE<br>72-HR<br>531.38               |
|                                 |                              | CUMULATIVE AREA = 0.0 SQ MI                            |

ROUTED SUMMARY  
 FLOW IN CUBIC FEET PER SECOND  
 TIME IN HOURS. AREA IN SQUARE MILES

| OPERATION                               | STATION | PEAK<br>FLOW | TIME OF<br>PEAK | AVERAGE FLOW FOR MAXIMUM PERIOD<br>6-HOUR 24-HOUR 72-HOUR | RASTH<br>AREA | MAXIMUM<br>STAGE | TIME OF<br>MAX STAGE |
|---|---------|--------------|-----------------|---|---------------|------------------|----------------------|
| HYDROGRAPH AT<br>ROUTED TO<br>ROUTED TO | A1      | 300.         | 0.33            | 300.  | 278.          | 296.             |                      |
|   | A2      | 3178.        | 4.92            | 683.  | 391.          | 391.             | 4.08                 |
|   | A5      | 2686.        | 4.92            | 661.  | 385.          | 365.             | 4.92                 |

PLAN 1 .....

ELEVATION  
SURFACE  
OUTFLOW

RATIO  
OF  
PIF  
1.00  
536.83

MAXIMUM  
RESERVOIR  
W.S. ELEV  
0.03

INITIAL VALUE  
535.00  
15%  
0.

MAXIMUM  
STORAGE  
AC-FT  
216.

SPILLWAY CRIST  
535.00  
15%  
4712.

MAXIMUM  
OUTFLOW  
CFS  
3178.

DURATION  
OVER TOP  
HOURS  
0.37

TOP OF LAF  
536.80  
212.  
6632.

TIME OF  
MAX OUTFLOW  
HOURS  
4.92

TIME OF  
FAILURE  
HOURS  
3.92



SUMMARY OF DWP OVERLAP INSPECTION ANALYSIS FOR STATION A5

PLAN 1 .....

| RATIO<br>OF<br>PHF | MAXIMUM<br>RESERVUOR<br>W.S. LEV | MAXIMUM<br>DEPTH<br>OVER DAM | MAXIMUM<br>STORAGE<br>ACFT | MAXIMUM<br>OUTLET<br>CFS | DURATION<br>OVER TOP<br>HOURS | TIME OF<br>MAX OUTFLOW<br>HOURS | TIME OF<br>FAILURE<br>HOURS |
|--------------------|----------------------------------|------------------------------|----------------------------|--------------------------|-------------------------------|---------------------------------|-----------------------------|
|                    |                                  |                              |                            |                          |                               |                                 |                             |
| 1.00               | 533.00                           | 1.46                         | 142.                       | 2400.                    | 3.50                          | 9.92                            | 0.0                         |

ELEVATION  
STORAGE  
BOTTOM

INITIAL VALU  
531.10  
100.  
200.

SPILLWAY CRIST  
531.90  
11.  
0.

TOP OF DAM  
531.90  
100.  
534.

\*\*\* NORMAL END OF JOB \*\*\*

APPENDIX 6  
REFERENCES

KAMPFE LAKE DAM

APPENDIX 6  
REFERENCES

KAMPFE LAKE DAM

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END

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